15TH ANNUAL

SRS

STUDENT RESEARCH SYMPOSIUM

March 4 and 5, 2022

A Showcase of Student Discovery and Innovation
Celebrating the achievements of SDSU student research, scholarship, and creative activity

Visit our website: SRS.SDSU.EDU

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UNIVERSITY

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Division of Student Affairs
and Campus Diversity

Charles Wei-hsun Fu
Foundation
傅偉勳

SRS

15th Annual Student Research Symposium

March 4 and March 5, 2022

Celebrating the achievements of
San Diego State University students in
research, scholarship & creative activity

SAN DIEGO STATE
UNIVERSITY

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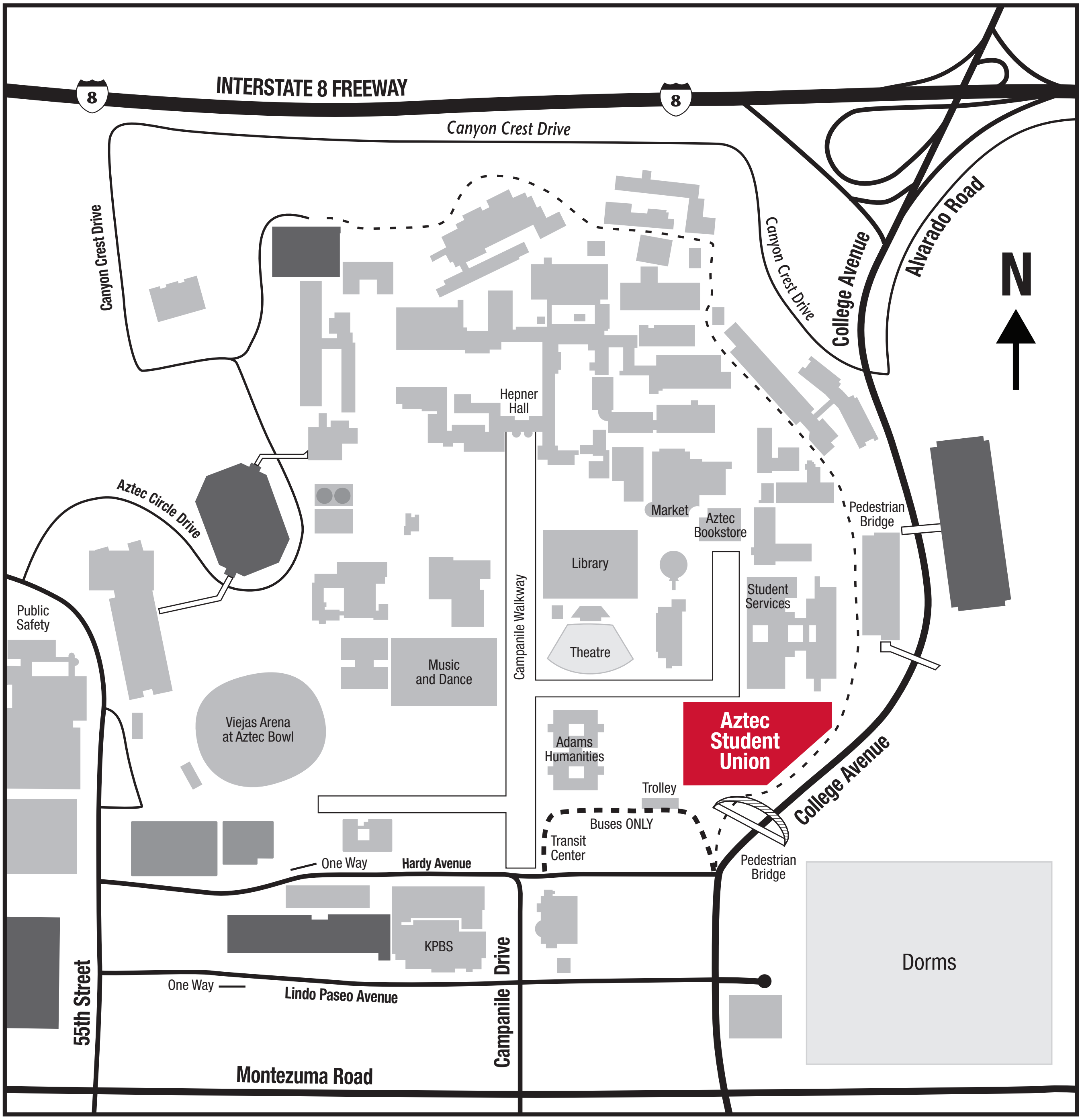
SAN DIEGO STATE UNIVERSITY CAMPUS MAP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8
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Canyon Crest Drive
College Avenue
Alvarado Road
N
Hepner Hall
Aztec Circle Drive
Market
Aztec Bookstore
Pedestrian Bridge
Library
Student Services
Public Safety
Campanile Walkway
Theatre
Music and Dance
Viejas Arena at Aztec Bowl
Adams Humanities
Aztec Student Union
Trolley
College Avenue
Buses ONLY
Transit Center
Pedestrian Bridge
One Way
Hardy Avenue
KPBS
Dorms
55th Street
One Way
Lindo Paseo Avenue
Campanile Drive
Montezuma Road

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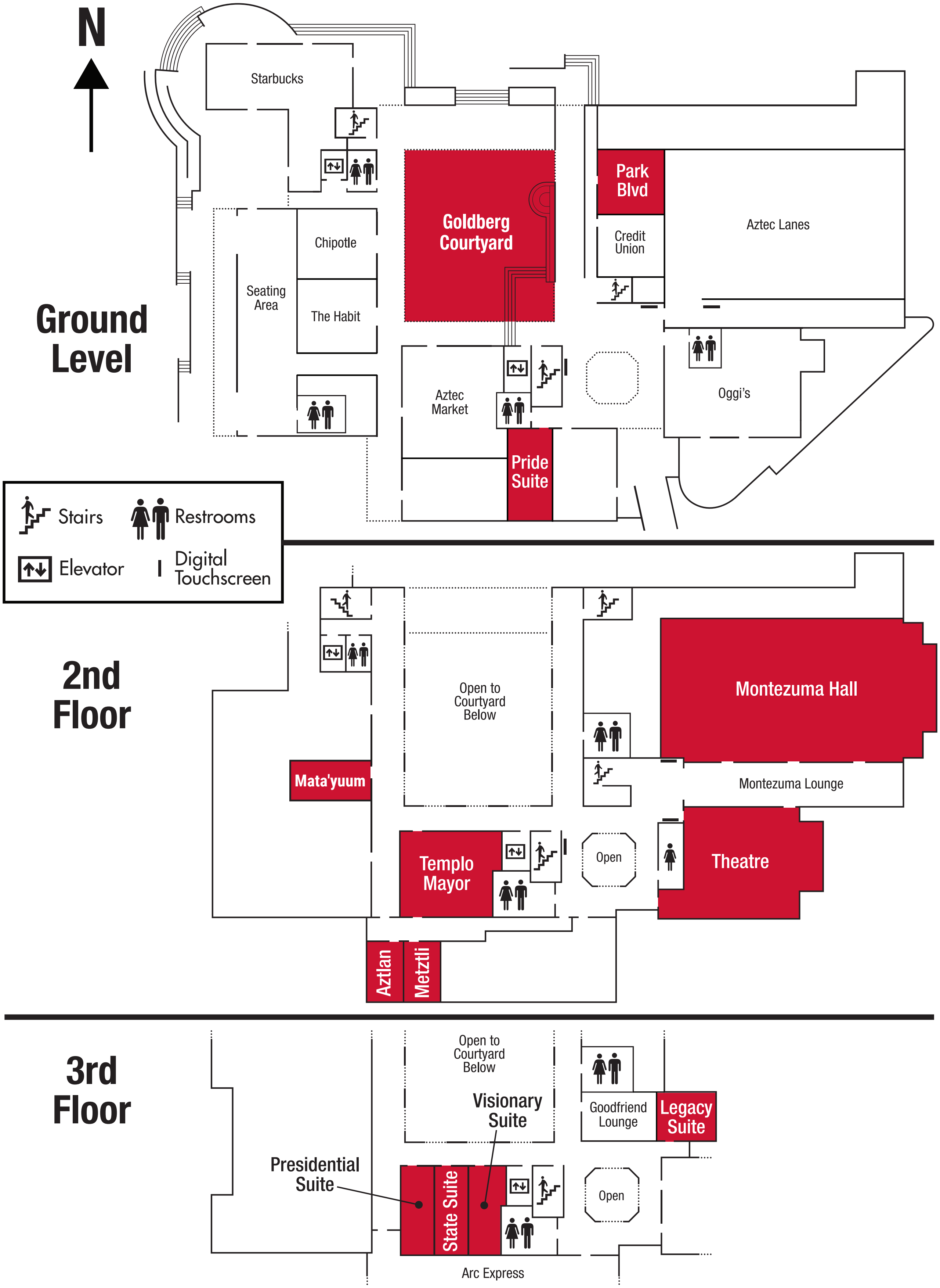
AZTEC STUDENT UNION MAP


N
Ground Level
Starbucks
Goldberg Courtyard
Park Blvd
Aztec Lanes
Credit Union
Chipotle
Seating Area
The Habit
Aztec Market
Oggi's
Pride Suite
Stairs
Restrooms
Elevator
Digital Touchscreen
2nd Floor
Open to Courtyard Below
Montezuma Hall
Mata'yuum
Montezuma Lounge
Templo Mayor
Open
Theatre
Aztlan
Metztli
3rd Floor
Open to Courtyard Below
Visionary Suite
Goodfriend Lounge
Legacy Suite
Presidential Suite
State Suite
Open
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NORTHROP GRUMMAN

Adela de la Torre
President
San Diego State University

March 4, 2022

Dear colleagues and guests,

I want to welcome you to the 2022 Student Research Symposium at San Diego State University! This is the 15th year of this university-wide event that highlights the outstanding research and creative endeavors that distinguish SDSU. It is a wonderful opportunity to celebrate the innovation, academic scholarship, and creativity that our undergraduate and graduate students bring to their research. It is also a forum for sharing their discoveries, insights, and performances with our university family and the broader community.

We are so proud that 390 students are presenting original scholarly work this year. More than 70 of them will receive awards for field-specific excellence and impact. Ten of those students, those whose entries are judged truly exceptional, will later represent SDSU at the annual California State University Student Research Competition in April.

I am proud of our phenomenal students, as well as our dedicated faculty and staff who have encouraged our student researchers and are coordinating this symposium. I am also grateful for the 200+ volunteers and experts who are giving their time and evaluating the oral, poster, exhibit and performance presentations. Their dedication augments SDSU's commitment to cutting edge research and creative endeavors.

This symposium represents the spirit of SDSU as a leading public research university. It is a vibrant expression of our students as future leaders and innovators who will impact their communities and solve the world's greatest challenges.

My hope is that you will be inspired as well.

Adela de la Torre, Ph.D.
President
San Diego State University

Hala Madanat, Ph.D.
Interim Vice President of Research and Innovation
San Diego State University

Students are essential to the San Diego State University research enterprise. Each year, hundreds of undergraduate and graduate students participate in discovery, helping faculty advance research, scholarship and creative activities. The lab, the field or the stage — they’re all part of an innovative education aimed at preparing the next generation of leaders.

Hala Madanat, Ph.D.
Vice President of Research and Innovation
San Diego State University

William Tong, Ph.D.
Vice Provost
Distinguished Professor of Chemistry and Biochemistry
Director, SDSU NIH IMSD Program

Bill Tong joined San Diego State University in 1985 as an associate professor after his postdoctoral research at the Oak Ridge National Laboratory, U.S. Department of Energy. In 1989, five years after receiving his Ph.D., he was promoted to professor. He has mentored more than 50 Ph.D. (University of California San Diego and San Diego State) and Master's students and more postdoctoral students and visiting scientists/professors.

He was named the 2003 Distinguished Scientist of the Year by the American Chemical Society (San Diego region). He received the Albert Johnson University Research Award. He also received the 2017 SDSU Faculty Diversity Award, the 2005 Distinguished Achievement Award from the Sigma Xi Research Society, the 2008 SDSU President Leadership Award, and the 2002 SDSU Technology Innovation Award.

He has been awarded major grants by the U.S. National Science Foundation, U.S. National Institutes of Health (R01), U.S. National Institute of General Medical Sciences, U.S. Department of Defense, U.S. Department of Homeland Security, U.S. Army Research Office, and other funding agencies. He has been the PI of the NIH IMSD grant for years to support STEM underrepresented students from multiple SDSU colleges. He holds various patents on nonlinear multi-photon laser methods. He regularly serves on NIH, NSF, DOE, NASA and ACS review panels and study sections and reviews for peer-reviewed research journals. He founded a laser technology company in La Jolla, California, for U.S. security projects.

Bill Tong has developed novel nonlinear multi-photon laser methods for chemical analysis with zeptomole-level (10-21 mole) or sub-parts-per-quadrillion-level detection sensitivity for a wide range of areas including biomedical, environmental, and security applications. His novel laser methods offer better detection sensitivity levels for molecules in their native form without using tags or labels. Picoliter-level probe volumes offer effective interfacing to sensors, microchannels, microarrays, lab-on-a-chip, and microfluidic devices. Potential applications of his ultrasensitive laser methods include earlier detection of diseases (Parkinson's, Alzheimer's, Multiple Sclerosis, etc.), more sensitive detection of biomarkers, cancer cells and viruses, better design of cleaner drugs, more sensitive detection of pollutants both inside the human body and in the environment, remote standoff detection of chem/bio agents, and authentication of paintings and art objects.

Thursday, March 3, 2022 - Registration

1:00 pm – 4:00 pm Registration Aztec Student Union, Montezuma Theater

Friday, March 4, 2022 - Opening Remarks

8:30 am – 9:00 am Hala Madanat, Vice President of Research and Innovation
Student Union, Theatre, Room 270

Friday, March 4, 2022 - Industry Sponsor Panel

2:00 pm – 3:00 pm Student Union, Theatre, Room 270

Friday, March 4, 2022- Sessions A-D

8:00 am – 4:00 pm Registration Aztec Student Union, Montezuma Lounge

Time	Session Number	Session Type	Session Title	Presentation Location
9:00 am	A-1	Oral	Behavioral and Social Sciences 1	Park Boulevard
	A-2	Oral	Behavioral and Social Sciences 2	Mata'yuum
	A-3	Oral	Behavioral and Social Sciences 3	Aztlan
	A-4	Oral	Biological and Agricultural Sciences 1	Metzli
	A-5	Oral	Humanities, History, Literature, Philosophy 1	Templo Mayor
	A-6	Oral	Engineering and Computer Science 1	Visionary Suite
	A-7	Oral	Physical and Mathematical Sciences 1	Legacy Suite
	A-8	Oral	Creative Arts and Design / Visual or Performing Arts 1	Pride Suite
11:00 am	B-1	Oral	Behavioral and Social Sciences 4	Park Boulevard
	B-2	Oral	Behavioral and Social Sciences 5	Mata'yuum
	B-3	Oral	Biological and Agricultural Sciences 2	Aztlan
	B-4	Oral	Humanities, History, Literature, Philosophy 2	Metzli
	B-5	Oral	Engineering and Computer Science 2	Templo Mayor
	B-6	Oral	Physical and Mathematical Sciences 2	Visionary Suite
	B-7	Oral	Creative Arts and Design / Visual or Performing Arts 2	Legacy Suite
1:00 pm	C-1	Oral	Behavioral and Social Sciences 6	Pride Suite
	C-2	Oral	Behavioral and Social Sciences 7	Park Boulevard
	C-3	Oral	Biological and Agricultural Sciences 3	Mata'yuum
	C-4	Oral	Humanities, History, Literature, Philosophy 3	Aztlan
	C-5	Oral	Engineering and Computer Science 3	Metzli
	C-6	Oral	Business Economics and Public Administration / Education 1	Templo Mayor
	C-7	Oral	Health Nutrition and Clinical Sciences 1	Visionary Suite
3:00 pm	D-1	Oral	Behavioral and Social Sciences 8	Legacy Suite
	D-2	Oral	Behavioral and Social Sciences 9	Pride Suite
	D-3	Oral	Biological and Agricultural Sciences 4	Park Boulevard
	D-4	Oral	Humanities, History, Literature, Philosophy 4	Mata'yuum
	D-5	Oral	Engineering and Computer Science 4	Aztlan
	D-6	Oral	Business Economics and Public Administration / Education 2	Metzli
	D-7	Oral	Health Nutrition and Clinical Sciences 2	Templo Mayor

Friday, March 4, 2022 - Sessions F-K

8:00 am – 4:00 pm Registration Aztec Student Union, Montezuma Lounge

Time	Session Number	Session Type	Session Title	Presentation Location
9:00 am	F-1	Poster	Behavioral and Social Sciences 12	Montezuma Hall
	F-2	Poster	Behavioral and Social Sciences 13	Montezuma Hall
	F-3	Poster	Biological and Agricultural Sciences 7	Montezuma Hall
	F-4	Poster	Biological and Agricultural Sciences 8	Montezuma Hall
	F-5	Poster	Engineering and Computer Science 5	Montezuma Hall
	F-6	Poster	Physical and Mathematical Sciences 3	Montezuma Hall
	F-7	Poster	Health Nutrition and Clinical Sciences 3	Montezuma Hall
	F-8	Poster	Business Economics and Public Administration / Education 4	Montezuma Hall
11:00 am	G-1	Poster	Behavioral and Social Sciences 14	Montezuma Hall
	G-2	Poster	Behavioral and Social Sciences 15	Montezuma Hall
	G-3	Poster	Biological and Agricultural Sciences 9	Montezuma Hall
	G-4	Poster	Biological and Agricultural Sciences 10	Montezuma Hall
	G-5	Poster	Engineering and Computer Science 6	Montezuma Hall
	G-6	Poster	Physical and Mathematical Sciences 4	Montezuma Hall
	G-7	Poster	Health Nutrition and Clinical Sciences 4	Montezuma Hall
	G-8	Poster	Humanities, History, Literature, Philosophy / Creative Arts and Design 6	Montezuma Hall
1:00 pm	H-1	Poster	Behavioral and Social Sciences 16	Montezuma Hall
	H-2	Poster	Behavioral and Social Sciences 17	Montezuma Hall
	H-3	Poster	Biological and Agricultural Sciences 11	Montezuma Hall
	H-4	Poster	Biological and Agricultural Sciences 12	Montezuma Hall
	H-5	Poster	Engineering and Computer Science 7	Montezuma Hall
	H-6	Poster	Physical and Mathematical Sciences 5	Montezuma Hall
	H-7	Poster	Health Nutrition and Clinical Sciences 5	Montezuma Hall
	H-8	Poster	Interdisciplinary 1	Montezuma Hall
3:00 pm	I-1	Poster	Behavioral and Social Sciences 18	Montezuma Hall
	I-2	Poster	Behavioral and Social Sciences 19	Montezuma Hall
	I-3	Poster	Behavioral and Social Sciences 20	Montezuma Hall
	I-4	Poster	Biological and Agricultural Sciences 13	Montezuma Hall
	I-5	Poster	Engineering and Computer Science 8	Montezuma Hall
	I-6	Poster	Physical and Mathematical Sciences 6	Montezuma Hall
9:00 am	J-1	Exhibit	Visual Arts 1	Montezuma Hall
11:00 am	K-1	Performance Arts	Performance Arts 1	Montezuma Theatre

Saturday, March 5, 2022 - Sessions E

8:00 am – 11:00 am Registration Aztec Student Union, Montezuma Lounge

Time	Session Number	Session Type	Session Title	Presentation Location
10:00 am	E-1	Oral	Behavioral and Social Sciences 10	Visionary Suite
	E-2	Oral	Behavioral and Social Sciences 11	Legacy Suite
	E-3	Oral	Biological and Agricultural Sciences 5	Pride Suite
	E-4	Oral	Biological and Agricultural Sciences 6	Park Boulevard
	E-5	Oral	Humanities, History, Literature, Philosophy 5	Mata’yuum
	E-6	Oral	Business Economics and Public Administration / Education 3	Aztlan

12:15 pm - 1:45 pm Lunch Reception Goldberg Courtyard

2:00 pm - 4:00 pm Keynote and Closing Award Ceremony

Awards will be presented at the closing award ceremony on Saturday, March 5th, 2022, to recognize the most outstanding presentations in research, scholarship, and creative activities at the Student Research Symposium. The awards are as follows:

President’s Awards

Ten President’s Awards of $500 will be given to the most outstanding oral presentations across all disciplines. Those receiving a President’s Award will represent SDSU at the California State University (CSU) Student Research Competition which will be held virtually on April 29 and 30, 2022.

President’s Award for the Arts

One President’s Award for the Arts of $500 will be given to an outstanding presentation in the performance arts or exhibit category. This award is not eligible for the CSU competition.

Dean’s Awards

Sixteen Dean’s Awards of $250 will be given for oral or poster presentations. Awards will go to the top presentations in each college.

Provost’s Awards

Sixteen Provost’s Awards of $200 will be given for poster presentations. Awards will go to the top presentations in each college.

Undergraduate Research Excellence Awards

Ten Undergraduate Research Excellence Awards of $150 will be given for oral or poster presentations across all disciplines recognizing scholarly achievement.

Library Awards

Five Library Awards of $250 will be given for oral or poster presentations. Awards will go to the best projects using library resources and collections, including, but not limited to printed resources, databases, primary resources, and materials in all media.

Research Awards for Diversity, Inclusion, and Social Justice

Diversity, social justice, and inclusiveness reflect some of the values at the core of our university mission. Five $250 awards will be given to the best oral or poster presentations that exemplify our ongoing commitment to diversity, inclusion, and social justice.

Outstanding Creative and Performing Arts Award

One Outstanding Creative and Performing Arts Award of $250 will be given.

Arts Exhibit Award

One Arts Exhibit Award of $250 will be given.

Summer Undergraduate Research Program (SURP) Award

Two $250 awards will be given for oral or poster presentations by students who have participated in the SURP program.

Arts Alive Award

The SRS Arts Alive SDSU Award is offered to an outstanding student from any academic program who integrates the arts as part of an interdisciplinary research project that addresses cultural or sociopolitical issues. One award of $250 will be given.

Charles Wei-Hsun Fu Foundation Philosophy Award

The Charles Wei-Hsun Fu Foundation Philosophy Award is for students doing excellent research in the field of philosophy and encourages a special niche where philosophy students can shine. This award is open to all students who are engaged in philosophical research that are presenting an oral project at SRS. One award of $500 will be given.

Sustainability Award

The Center for Regional Sustainability (CRS) fosters research; establishes collaborations across campus and with partners from business, government, and education; and generates solutions that enhance the natural environment, economic vitality, and social equity in the greater San Diego-Tijuana region. CRS sponsors the SDSU Student Research Symposium Sustainability Award to recognize student work that focuses on creating a more just, equitable, and sustainable world by integrating vital environmental, social, and economic needs of the present while ensuring future prosperity. One award of $250 will be given.

Women in Engineering Awards

The Women-in-Engineering (WIE) award has been presented during the SDSU's yearly Student Research Symposium (SRS) event since 2015. This award aims to promote women student engineers/researchers from the College of Engineering at the undergraduate (BS) and graduate (MS/PhD) degree education levels. The first, second and third prize amounts are $250, $200 and $150, respectively and will be awarded to the top three women engineers/researchers from the College of Engineering based on SRS oral/poster judging criteria. This award is sponsored by Prof. Satish Sharma, Director, Antenna and Microwave Lab (AML), Department of Electrical and Computer Engineering.

HSI/AANAPSI Award

The Office of HSI and Regional Affairs Student Research award goes to the top student whose research furthers our understanding of serving Latinx, Chicanx, Hispanic, Asian American, Native American, and Pacific, Islander students in higher education, or contributes to the commitment to honor our designation as an HSI/AANAPSI. Two awards of $250 will be given.

***Please note** – Students receiving one award will not be considered for additional awards.

Saturday, March 5th, 2022

Lunch Reception:

12:15 pm -1:45 pm, Aztec Student Union, Goldberg Courtyard

Keynote Address and Closing Awards Ceremony:

2:00 pm - 4:00 pm, Aztec Student Union, Montezuma Hall

Saturday afternoon events are open to all student presenters, mentors, and judges.

Closing Awards Ceremony 2022 Student Research Symposium

Welcome

Keynote Address

Awards*

HSI/AANAPSI Award

Women in Engineering Awards

Sustainability Award

Charles Wei-Hsun Fu Foundation Philosophy Award

Arts Alive Award

Summer Undergraduate Research Program (SURP) Award

Arts Exhibit Award

Outstanding Creative and Performing Arts Award

Research Awards for Diversity, Inclusion, and Social Justice

Library Awards

Undergraduate Research Excellence Awards

Provost's Awards

Dean's Awards

President's Award for the Arts

President's Awards

Closing Remarks

* Photos will be taken of each recipient as they receive the award. Group photos will be taken immediately after the ceremony. Recipients are encouraged to stay for group photos.

Oral Presentations

Friday, March 4, 2022

Sessions A-D

Saturday, March 5, 2022

Session E

Poster presenters are required to stand by their poster during the entire 1-hour and 30 minute discussion period. Each oral presentation is allotted 10 minutes followed by a 5-minute question and answer period. Participants and guests are asked to enter or leave the rooms only between presentations.

San Diego State University

(U) = Undergraduate; (M) = Masters; (D) = Doctoral

Friday, March 4, 2022

Session A: Oral Presentations

Session A-1

Oral Behavioral and Social Sciences 1
Friday, March 4, 2022, 9:00 am
Location: Park Boulevard

100 9:05 am

Chronically Online: An Analysis of Parasocial Relationships

Shaylee Anderson, Communication (U)

101 9:20 am

Understanding the Effects of Misinformation: Reaching the Communities at Risk

Ricardo Duarte, Social Work (M)

102 9:35 am

Girlhood and Mental Health: Representations in Media

Emily Teaze, Interdisciplinary Studies (English, Women's Studies, Art-Illustration and Drawing) (U)

103 9:50 am

A text mining analysis of the Parler social media platform

Timothy Andersen, Big Data Analytics (M)

104 10:05 am

Crime Reporting and the Formation of Place Identity in Cape Town Communities

Michelle Jeliazkov, Political Science (U)

105 10:20 am

Fast and furious: identifying meaningless data in the Women's Health and Wealth web-based survey

Ijeoma Ogbannaya, Interdisciplinary Studies in Substance Use (D)

Session A-2

Oral Behavioral and Social Sciences 2
Friday, March 4, 2022, 9:00 am
Location: Mata'yuum

106 9:05 am

Systematic Review Process

Rebekah Alvarado, Sociology (U)

107 9:20 am

Prevalence of the School to Prison Pipeline in San Diego

Nicole Mendoza, Sociology, History and Criminal Justice (U)

108 9:35 am

Services, Not Sweeps: Community Responses to City-Sanctioned Homeless Encampment Sweeps in Los Angeles, CA

Nicolas Gutierrez III, Criminal Justice and Criminology (M)

109 9:50 am

The Research to Practice Gap: Exploring the attitudes toward evidence-based practices in substance use providers

Melanie Nicholls, Interdisciplinary Studies in Substance Use (D)

110 10:05 am

Open Drug Scenes: a call for environmental interventions

Alexandra Almeida, Interdisciplinary Studies in Substance Use (D)

111 10:20 am

Investigating if neurocognitive abilities post drinking initiation in late adolescence can predict changes in later alcohol use

Nafisa Ferdous, Interdisciplinary Studies in Substance Use (D)

Session A-3

Oral Behavioral and Social Sciences 3
Friday, March 4, 2022, 9:00 am
Location: Aztlan

112 9:05 am

Investigating How Prenatal THC, Nicotine, and Combination of Both Affects Sensorimotor Maturation in Rats

Samantha Tasman, Psychology (U)

(U) = Undergraduate; (M) = Masters; (D) = Doctoral

113 9:20 am

Effect of Prenatal Exposure to THC, Nicotine, and Combination of Both on Early Motor Development in Rats

Alia Westphal, Psychology (U)

114 9:35 am

Choline Supplementation Mitigates Effects of Prenatal THC Exposure on Spatial Memory in Rats

Karen Thomas, Psychology (M)

115 9:50 am

Childhood Adversities and Social Support Experienced by Latinx Young Adults: A Qualitative Study

Sarah Chavez, Interdisciplinary Research on Substance Use (D)

116 10:05 am

Intergenerational trauma and substance use: A qualitative study exploring substance use within the East Africa community in San Diego, California

Dania Abu Baker, Interdisciplinary Research on Substance Use (D)

Session A-4

Oral Biological and Agricultural Sciences 1

Friday, March 4, 2022, 9:00 am

Location: Metzli

117 9:05 am

The transcriptional control of CG11617 in Muscle Development

Elizabeth Trujillo, Cell and Molecular Biology (D)

118 9:20 am

Aging-related post translational modifications of myosin influence sarcopenia and may be ameliorated by foxo expression

Clara Neal, Molecular Biology (M)

119 9:35 am

Neural signature of executive dysfunction associated with long COVID: A multimodal brain imaging approach

David White, Psychology (M)

120 9:50 am

Cerebrovascular modeling of Cockayne Syndrome B using iPSC-derived cerebral organoids and vascular cells

Aaliyah Staples-West, Interdisciplinary Studies: Chemistry, Biology, Africana Studies, language in Spanish (U)

121 10:05 am

3D Retinal Organoids with Pax2 Optic Stalk Reporter

Matthew Patterson, Biology with an emphasis in Molecular and Cellular (U)

122 10:20 am

Direct Conversion of Somatic Fibroblasts into Glial Cells

Ryan Goodman, Chemistry-Emphasis in Biochemistry (U)

Session A-5

Oral Humanities, History, Literature, Philosophy 1

Friday, March 4, 2022, 9:00 am

Location: Templo Mayor

123 9:05 am

The Strategic Masculinities of Nathan Harrison

Jamie Bastide, Anthropology (M)

124 9:20 am

Excavating a Community: Recreating and Examining the Demographics of the San Diego State University Imperial Valley Campus Neighborhood in Calexico, CA 1940

Valeria Villafuerte, Social Science (U)

125 9:35 am

An archival exploration of San Diego State University - Imperial Valley Growth

Carlos Fitch, History and Spanish (U)

126 9:50 am

Undoing Revolution: Race and Gay Activism in San Diego, 1969-1979

Joseph Schaeffer, History (U)

127 10:05 am

A Native American Perspective on Sustainable and Resilient Infrastructure in Southern California

Fatima Shahine, Environmental Engineering (U)

(U) = Undergraduate; (M) = Masters; (D) = Doctoral

128 10:20 am

Nuclear Power and Environmental Justice: A sociodemographic case study of decommissioned California power plants

Jordan Alcarez, City Planning (M)

Session A-6

Oral Engineering and Computer Science 1

Friday, March 4, 2022, 9:00 am

Location: Visionary Suite

129 9:05 am

Detection, Quantification, and Simplified Wastewater Surveillance Model of SARS-CoV-2 in the Tijuana River

Alma Rocha, Civil Engineering (Environmental Engineering) (M)

130 9:20 am

Novel Microfluidics Platform for Detection of COVID-19 Virus

Xavier Leasau, 4+1 BS/MS Mechanical Engineering / Bioengineering (U)

131 9:35 am

Open channel and managing stormwater

Ahmed Shubar, Civil Engineering (U)

132 9:50 am

Evaluation of Urban Flooding with Remote Sensing and Machine Learning

Vincent O'Hara-Rhi, Civil Engineering (M)

133 10:05 am

A Holistic Work Zone Safety Approach using Wearable Technology

Farid Shahnavaz, Computational Science (M)

134 10:20 am

Unmanned Aerial Systems (UAS) Impact on Driving Distraction

Newsha Emaminejad, Civil and Construction Engineering (M)

Session A-7

Oral Physical and Mathematical Sciences 1

Friday, March 4, 2022, 9:00 am

Location: Legacy Suite

135 9:05 am

Photocatalytic and electrocatalytic upcycling of polyethylene terephthalate to H2 and valuable chemicals

Audrey Washington, Chemistry (U)

136 9:20 am

Impacts of Climate Change on Extreme Fire Weather

David Rother, Geography (D)

137 9:35 am

Spectral Unmixing Techniques Examined for Analysis of Herbaceous Fractional Cover in Wildfire-Prone Shrublands in Southern California, USA

Krista West, Geography (D)

138 9:50 am

Evaluating the Regional Climate Impact of Secondary Forests in the Brazilian Amazon

Mallorie Honey, Geography (M)

139 10:05 am

Brazilian Amazon Deforestation Impact on Dry Season Climate

Corrie Monteverde, Geography (D)

140 10:20 am

LCLUC Impacts of Arctic Oil/Gas Exploration

Avi Martin, Geographic Information Science and Technology (U)

Session A-8

Oral Creative Arts and Design / Visual or Performing Arts 1

Friday, March 4, 2022, 9:00 am

Location: Pride Suite

141 9:05 am

Women in Leadership Roles: Classical Voice / Opera

Jade Popper, Music (M)

(U) = Undergraduate; (M) = Masters; (D) = Doctoral

142 9:20 am

Examining Experiences in College Music Theory Courses Through the Lens of Different Primary Instrument Groups

Barbara Macz, Music Global Composition (M)

143 9:35 am

The Intertwined Experience of Sound and Vision

Nathaniel BeuMaher, Jazz Studies (U)

144 9:50 am

Examining Technology's Influence on the Values of Bedroom Pop Artist Lyn Lapid

Dennis Henry Monsalud, Music Education (U)

145 10:05 am

Seeking Crisis Information

Phillip VanderWeit, Communication (M)

Friday, March 4, 2022

Session B: Oral Presentations

Session B-1

Oral Behavioral and Social Sciences 4

Friday, March 4, 2022, 11:00 am

Location: Park Boulevard

146 11:20 am

Employee Experience Through Digital Transformatio

Manahil Nasim, Management Information Systems (U)

147 11:35 am

DataSwagger: A Systemic Approach to Train, Motivate and Engage Data Savvy Employees

Robert Brodskiy, Management Information Systems (U)

148 11:50 am

Nourishing & Encouraging Digital Intrapreneurship Behavior

Ivan D Ortiz Sandoval, Marketing (U)

149 12:05 pm

Digital Entrepreneurial Mindset

Timothy Seitola, Business Administration: Information Systems (M)

150 12:20 pm

Reflectiveness in Digital Environments: The Missing Link Between Mindfulness & Productivity

Melissa Klase, Psychology (U)

Session B-2

Oral Behavioral and Social Sciences 5

Friday, March 4, 2022, 11:00 am

Location: Mata'yuum

151 11:05 am

How Neural Measures of Attention Relate to Visual Working Memory Capacity and Trait Anxiety

Marisa Krauter, Psychology (U)

152 11:20 am

Phonetic Variation During Speech Production in Spanish-English Bilingual Adults - An online experiment

Andrea Galvez-McDonough, Speech, Language, and Hearing Sciences (U)

153 11:35 am

Managing Direct Complaints in Everyday English Conversation

Abigail Coulson, Linguistics (U)

154 11:50 am

A Novel Sentiment Analysis Approach for Investigating Empathic Communication in Adults with Chronic Musculoskeletal Pain in an Outpatient Physical Therapy Setting

Chelsea Chapman, Public Health (D)

155 12:05 pm

The impacts of COVID-19 on mental health, well-being, and beliefs among the San Diego State University population

Jennifer Adams, Public Health (U)

156 12:20 pm

Social Networking Site Usage and Needs: Effects on Social Connectedness and Perceived Loneliness During the COVID-19 Pandemic

Mary Botrous, Psychology (U)

(U) = Undergraduate; (M) = Masters; (D) = Doctoral

Session B-3

Oral Biological and Agricultural Sciences 2

Friday, March 4, 2022, 11:00 am

Location: Aztlan

157 11:05 am

Role of macrophages in activation of NF-kB in ovarian tumor-initiating cells

Denay Stevenson, Cell and Molecular Biology (M)

158 11:20 am

SOX2 and OCT4 Activity Identify CSC Populations in Ovarian Cancer

Luisjesus Cruz, Cell and Molecular Biology (D)

159 11:35 am

The role of chemotherapy-induced fibrosis in the maintenance of tumor initiating cells

Omar Lujano Olazaba, Cell and Molecular Biology (D)

160 11:50 am

Establishing R132Q IDH1 sensitivity to reducing agents

Nalani Coleman, Chemistry - Emphasis in Biochemistry (U)

161 12:05 pm

VAX014, a novel oncolytic immunotherapy for bladder cancer, may aid in overcoming tumor immune escape via Type I IFN-mediated upregulation of PD-L1 and MHC-I

Kinsey Nelson, Biology (M)

Session B-4

Oral Humanities, History, Literature, Philosophy 2

Friday, March 4, 2022, 11:00 am

Location: Metzli

162 11:05 am

“All the world’s a stage”: Victoria’s Media Performance and the Birth of the Royal Family Brand

Taryn Duffy, History (M)

163 11:20 am

Exceeding Singular Identity Narratives of Queer and Disabled Representations in Romantic Films

Nicholas Villarreal, Women’s Studies (M)

164 11:35 am

African American Women and Progressive Reform: Examining Social Action and Mental Health

Emily Windham. History (M)

165 11:50 am

Meditation and PTSD

Mariah Monreal, Philosophy (U)

166 12:05 pm

The Conundrum of Child Upbringing

Mariel Valle, Philosophy (M)

Session B-5

Oral Engineering and Computer Science 2

Friday, March 4, 2022, 11:00 am

Location: Templo Mayor

167 11:05 am

New Insights into Optimized Design and Surface Characterization of Neural Probes for In-vivo Detection of the Neurotransmitters Dopamine and Serotonin

Daniela Saldana, Bioengineering (M)

168 11:20 am

Can Low Detection Limits in Neurotransmitter Detection Be Achieved in Graphene and Glassy Carbon Neural Probes Through Microfabrication Process Optimization?

Lucía Carballo Chanfón, Bioengineering (M)

169 11:35 am

BCI (Brain Computer Interface) Meets Biology: What Does Biology Tell us About Expected Neuroplasticity in Patients With BCI Implants

Megan Ryder, Kinesiology (U)

170 11:50 am

Predicting phenotype to mechanotype relationship in cells based on intra-cellular signaling networks

Esra Tiftik, Bioengineering (D)

171 12:05 pm

Modeling Cellular Adhesion Strength

Clemence Rausa, Mechanical Engineering with Emphasis in Bioengineering (U)

(U) = Undergraduate; (M) = Masters; (D) = Doctoral

172 12:20 pm

Topic Modeling and Network Visualization to Explore Global Health Disparities

Nermeeta Dhillon, Bioinformatics and Medical Informatics (M)

Session B-6

Oral Physical and Mathematical Sciences 2

Friday, March 4, 2022, 11:00 am

Location: Visionary Suite

173 11:05 am

“Uninhabitable” Worlds in the Galaxy

Vladimir Bautista, Astronomy (U)

174 11:20 am

Classifying Viral Capsids

Colin Brown, Physics (M)

175 11:35 am

Quantifying entropy values for pregnant women’s activity patterns during their gestational period to dictate a good versus bad pregnancy

Sashiel Vagus, Applied Mathematics Dynamical Systems (M)

176 11:50 pm

Optimization of Alternative Solvents for the Labelling of Amino Acids on Extraterrestrial Bodies

Jessica Torres, Chemistry (D)

177 12:05 pm

Dynamics of the climax and attack communities in cystic fibrosis

Peter Uhl, Computational Science (D)

178 12:20 pm

Biomedical Application of Peptide Stapling

Joseph Hatton, Chemistry – Biochemistry (U)

Session B-7

Oral Creative Arts and Design / Visual or Performing Arts 2

Friday, March 4, 2022, 11:00 am

Location: Legacy Suite

179 11:05 am

Dearest All, So you don’t like Minneapolis, I’m so sorry. Goodbye

Jill Holslin, Master’s Degree in Fine Arts (M)

180 11:20 am

Sports Cards Are Messages: Textual Analysis of a Sports Card

Thomas Christensen, Mass Communication and Media Studies (M)

181 11:35 am

Trans Representation in Video Games

JJ Rezaei, Criminal Justice (U)

182 11:50 am

Yoko Ono & Fluxus: Blurring Boundaries, Creating Value

Dayne Sakazaki, Music Education (U)

Friday, March 4, 2022

Session C: Oral Presentations

Session C-1

Oral Behavioral and Social Sciences 6

Friday, March 4, 2022, 1:00 pm

Location: Pride Suite

183 1:05 pm

Pupil response and cognitive effort during online sentence processing in aphasia

Christina Sen, Language and Communicative Disorders (D)

184 1:20 pm

New Tasks to Measure Nonverbal Working Memory and Attention in Children

Sophie Levi, Language and Communicative Disorders (D)

185 1:35 pm

Telepractice for phonological disorders: Results from a complexity-based intervention

Abigail John, Language and Communicative Disorders (D)

186 1:50 pm

A Longitudinal Study of Trauma and the Development of Eating Disorders in Children

Rebecca Mendoza, Psychology (U)

(U) = Undergraduate; (M) = Masters; (D) = Doctoral

187 2:05 pm

Prenatal THC and nicotine e-cigarette exposure influences offspring motor coordination and balance

Jenna Wesely, Psychology (M)

188 2:20 pm

Evidence for Disproportionate Source Recognition Discriminability Impairment in Huntington's versus Alzheimer's Disease

Emma Churchill, , Psychology (M)

Session C-2

Oral Behavioral and Social Sciences 7

Friday, March 4, 2022, 1:00 pm

Location: Park Boulevard

189 1:05 pm

BrightSide Produce: Alleviating Food Deserts and Food Insecurity in the SDSU Community

Brooke Chan, Environmental Science (U)

190 1:20 pm

Support of Menstrual Products Provision in Four-Year Universities

Tanya Ortiz, Communication (M)

191 1:35 pm

A Qualitative Examination of Women Veteran's Healthcare Seeking Experiences

Monica McGill, Public Health Health Promotion and Behavioral Science (M)

192 1:50 pm

Exploring Persistent Substance Use Treatment Barriers in California

Caitanya Cook, Social Work (M)

193 2:05 pm

The Effects of Patient Behavioral Events (PBEs)

Ryan Lizerbram, Psychology (U)

Session C-3

Oral Biological and Agricultural Sciences 3

Friday, March 4, 2022, 1:00 pm

Location: Mata'yuum

194 1:05 pm

Genomic Methods for the Modeling of Archaic "Ghost" populations in Modern Humans

Michael Kuzminskiy, Biological and Medical Informatics (M)

195 1:20 pm

A new Enterobacteriaceae species that binds to the intestinal epithelial cells in the lumen of C. elegans and C. briggsae

Emily Morgan, Biology (U)

196 1:35 pm

Genome wide association of the Psyllid susceptibility in species of Eucalyptus

Rosalinda Diaz, Bioinformatics (M)

197 1:50 pm

Effect of UV Light Exposure and Compost Tea Supplementation on Growth, Antioxidant Activities, and Microbiome of Hydroponically-Grown Mustard Greens

Sherry Dinh, Food and Nutrition (U)

198 2:05 pm

Genetic examination of a coral settlement chemical from bacteria

Amanda Alker, Cell and Molecular Biology (D)

199 2:20 pm

A Bacterial Lipase Stimulates Animal Development in a Marine Tubeworm

Kyle E Malter, Biology (D)

Session C-4

Oral Humanities, History, Literature, Philosophy 3

Friday, March 4, 2022, 1:00 pm

Location: Aztlan

201 1:20 pm

Foundations for Sino-American Rapprochement: Mao's Ambiguous Revolution, 1964-1968

Ryan Garcia, History (M)

202 1:35 pm

Better off Home? Disparate Perspectives on the United States' Evacuation Efforts in South Vietnam 1975

Brian Nguyen, History (M)

203 1:50 pm

The Reagan Administrations Legacy: Cold War Policies and The Refugee Act of 1980

Phoebe Lutz, Political Science (U)

204 2:05 pm

Sino-Peruvian Communism: Transnational Currents in Sendero Thought in the Twentieth Century

Daniel Cook, History (M)

205 2:20 pm

Amerasian Diplomacy (or Lack Thereof): The Cold War Relationship Between the United States and the Philippines

Catherine Drzewiecki, History (M)

Session C-5

Oral Engineering and Computer Science 3

Friday, March 4, 2022, 1:00 pm

Location: Metztli

206 1:05 pm

Maximizing Ultrasonic Inspections Sensitivity in Composite Laminates by Analytical Calculation of Ultrasonic Scattering

Alexander Donabedian, Aerospace Engineering (U)

207 1:20 pm

Spectro-Microscopic Characterizations of Impact Mitigating Polymers

Nha Uyen Huynh, Mechanical Engineering (D)

208 1:35 pm

Carbon Black Particle production in Flame Spray Synthesis

Kaylin Sabado, Mechanical Engineering (U)

209 1:50 pm

A 3.75 nW Analog Electrocardiogram Processor Facilitating Stochastic Resonance for Real-Time R-wave Detection

Cihan Gungor, Electrical and Computer Engineering (D)

210 2:05 pm

Hydrodynamic Modeling and Control of a Wave Energy Converter Device

Rodolfo Callado, Mechanical Engineering (U)

211 2:20 pm

Miniaturized Printed Square Loop Antenna

Nhat Truong, Electrical Engineering (M)

Session C-6

Oral Business Economics and Public Administration / Education 1

Friday, March 4, 2022, 1:00 pm

Location: Templo Mayor

212 1:05 pm

Analyzing Adoption of Self-Service Analytics

Melarie Cardenas, Cybersecurity Management (M)

213 1:20 pm

Cybersecurity and Risk Initiative in Big Accounting Firms: An Experimental Perspective

Claire Wu, Accounting (U)

214 1:35 pm

Employee Experience with Digital Transformation: From Culture Readiness to Active Participation

Emma Tsztoo, Psychology (U)

215 1:50 pm

A comparison of expert and novice interpretation of multiple biology diagrams

Tina Marcroft, Math and Science Education (D)

216 2:05 pm

Maternal Education and Academic Performance of Kindergarten Students During the COVID-19 Pandemic

Hilda Parra, Language and Communicative Disorders (D)

217 2:20 pm

Parent Stress and Parent-Child Interaction in Children at Risk for Early Autism

Tina Ali, Child and Family Development (M)

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Session C-7

Oral Health Nutrition and Clinical Sciences 1
Friday, March 4, 2022, 1:00 pm
Location: Visionary Suite

218 1:05 pm

Effects of Blenderized Watermelon Consumption On BMI, Body Fat, and A1C in Overweight or Obese Children

Jaikko Daughtry, Nutritional Science (M)

219 1:20 pm

Night owl vs Early larks: Effect of chronotype on olfaction and diet quality

Alyssa Scruggs, Food and Nutrition (U)

220 1:35 pm

Age, Period, and Cohort Differences in Diet Quality among Women from the California Teachers Study

Vanessa Balingit Valdez, MPH – Epidemiology (M)

221 1:50 pm

A Preliminary Analysis of Concussion Disclosure in Military Service Members

Jennifer Vanderschaege, Athletic Training (U)

Friday, March 4, 2022

Session D: Oral Presentations

Session D-1

Oral Behavioral and Social Sciences 8
Friday, March 4, 2022, 3:00 pm
Location: Legacy Suite

222 3:05 pm

Co-Management of a Small-Scale Fishery in Moorea, French Polynesia

Paige Dawson, Anthropology (M)

223 3:20 pm

Coral Reef Restoration Practices, Methods, and Challenges In Moorea

Shannon Nelson-Maney, Anthropology (M)

224 3:35 pm

Assessing Plastic Pollution in San Diego County's port using satellite imagery

Aradhya Agrawal, Big Data Analytics (M)

225 3:50 pm

Pollution widespread in disadvantaged communities in San Diego and Imperial County, CA: Measuring progress towards the Sustainable Development Goals

Harmit Chima, Master of Science in Big Data Analytics Program (M)

226 4:05 pm

The repeatability of exploratory and defensive behaviors of Southern Pacific rattlesnakes (Crotalus oreganus): do individual snakes have consistent personalities?

Ricardo Gibert, Biology (U)

227 4:20 pm

The Salton Sea Crisis

Maahir Vasi, Economics (U)

Session D-2

Oral Behavioral and Social Sciences 9
Friday, March 4, 2022, 3:00 pm
Location: Pride Suite

228 3:05 pm

I Can't Feel Your Warmth: Tracing the Distance in My Father-Daughter Relationship

Shana Schoone, Communication (M)

229 3:20 pm

"I'd Like to Be a Househusband": What Asian American College Students Are Too Afraid to Say Because of Gender Roles

Brianna Pham, Health Communication (U)

230 3:35 pm

All Gays Go to Heaven

Julia Lyell, Health Communication (U)

231 3:50 pm

An Exploratory Factor Analysis of an Adapted Socialization and Support Questionnaire for High School Gender and Sexuality Alliance (GSA) Youth Members

Linda Salgin, Public Health (D)

232 4:05 pm

My Anger is Still a Small Boy: (Dis)embodied Anger as Survival

Damon Lawson, Communication Studies (M)

233 4:20 pm

Why Does Autoethnographic Research Matter? Developing a Meta-Counterstory from Students' Voices

Reychel Robles, English Single Subject Teaching (U)

Session D-3

Oral Biological and Agricultural Sciences 4

Friday, March 4, 2022, 3:00 pm

Location: Park Boulevard

234 3:05 pm

Cigarettes and Marine Systems: Exploring the Bioaccumulative Effects of Tobacco Waste on the Marine Bioindicator Species, Macoma nasuta

Jordan Alejo, Public Health with a Concentration in Environmental Health (M)

235 3:20 pm

Using functional traits to understand how the habitat structure of eelgrass (Zostera marina) affects the community of animals living within it

Karl Koehler, Biology (M)

236 3:35 pm

The effect of temperature increase on Panulirus interruptus metabolism and predation behavior

Vanessa Van Deusen, Biology (M)

237 3:50 pm

Germination Viability Based on Seed Depth of the Invasive Shrub Genista monosperma

Emily Marusin, Biology (U)

238 4:05 pm

The dismal future of pinyon woodlands in the Southwest

Ryan Buck, Evolutionary Biology (D)

239 4:20 pm

Cylindropuntia wolfii's regeneration and climatic change implications

Mia Almanza, Environmental Sciences (U)

Session D-4

Oral Humanities, History, Literature, Philosophy 4

Friday, March 4, 2022, 3:00 pm

Location: Mata'yuum

240 3:05 pm

The World's First Attempt at Monotheism? A Closer Look at Akhenaten's Religious Reforms

Christine Jacobites, History (M)

241 3:20 pm

Marie-Antoinette and Moral Conspiracy

Daniel Fazziola, History (U)

242 3:35 pm

News from Mexico: How Newspapers from Across the World Covered the Second French Intervention in Mexico

Cesar Cabrera Cazarez, History (M)

243 3:50 pm

Soured on the American Diet: Immigrant Resistance to Assimilation

Cassandra Onstad, History (M)

244 4:05 pm

Who He Is: The Trials, Tribulations and Triumphs of David Ruffin's Post-Temptation Career

Maximus Mieser, History (U)

245 4:20 pm

Spreading the Love: Comparing the 1986 Nonviolent Revolution in the Philippines to the 1989 Velvet Revolutions in Eastern Europe

Pamela deVega, History and Political Science (U)

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Session D-5

Oral Engineering and Computer Science 4

Friday, March 4, 2022, 3:00 pm

Location: Aztlan

246 3:05 pm

"#iorestoacasa": Twitter and the 2020 COVID-19 Pandemic in Milan, Italy. A Temporal and Translation Comparison

Karenina Nicoli Zaballa, Big Data Analytics (M)

247 3:20 pm

Uber-inspired Quality of Experience driven Pricing Model for 6G Wireless Multimedia Communications

Krishna Murthy Kattiyan Ramamoorthy, Computational Science (D)

248 3:35 pm

Can Machine Learning Be Used for Determining Interaction Between 2D & 3D Materials for Novel Semi-Conductor Devices

James Bunnell, Computer Engineering (U)

249 3:50 pm

Co-Robots Motion Planning in Crowds

Yu Chou, Computer Science (M)

Session D-6

Oral Business Economics and Public Administration / Education 2

Friday, March 4, 2022, 3:00 pm

Location: Metzli

250 3:05 pm

Types of Undergraduate Research Experiences in Chemistry and Biochemistry: A Qualitative Case Study Analysis of Influencing Agents

Sharai Mendez, Chemistry (M)

251 3:20 pm

STEM Experiential Learning at Hispanic Serving Institutions: Latinx Servingness

Rosa Tejeda, Post-Secondary Educational Leadership Student Affairs (M)

252 3:35 pm

Visualizing Black Multilinguals

Reka Barton, Education (D)

253 3:50 pm

An Imperial Valley student's testimonio: Experiences from a satellite campus

Alan Castro, Psychology (U)

254 4:05 pm

The Role of Undergraduate Research in Fostering Scholar Identities among Latina/o/x Community College Students

Lawson Hardrick III, Postsecondary Educational Leadership and Student Affairs (M)

255 4:20 pm

"What does it mean to be a anti-racist science educator and what does it look like?": A Cross-Case Study on Teacher Candidates' Anti-Racist Science Teaching Conceptualizations

Lucyann Atkins, Child And Family Development (U)

Session D-7

Oral Health Nutrition and Clinical Sciences 2

Friday, March 4, 2022, 3:00 pm

Location: Templo Mayor

256 3:05 pm

Sensitive Analysis of Cancer Biomarkers Using Laser Wave-Mixing Detector Interfaced to Microfluidics

Jie Liang, Chemistry (D)

257 3:20 pm

Modeling Non-Alcoholic Fatty Liver Disease in hIPSC Derived Hepatocytes

Karina Pastrana, Biology (U)

258 3:35 pm

Asian Glow: Aldehyde Dehydrogenase-2 Enzyme Polymorphism in the Asian Population and Its Link to Hepatocellular Carcinoma

Jenna Balingit, Cellular and Molecular Biology (U)

259 3:50 pm

Coordination of body state and foot placement related muscle activation for frontal plane walking balance

Remy Sprague, Kinesiology (U)

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Saturday, March 5, 2022

Session E: Oral Presentations

Session E-1

Oral Behavioral and Social Sciences 10

Saturday, March 5, 2022, 10:00 am

Location: Visionary Suite

260 10:05 am

A Mixed-Methods Examination of Colorism in the Context of Indian Children

Karanjot Kaur, Child Development (M)

261 10:20 am

Mental health service availability in Oaxaca and Michoacán, México

Stephanie Vera, Public Health and Latin American Studies (M)

262 10:35 am

Female Genital Mutilation in Kenya in comparison to Somalia

Denisse Vera, Political Science and International Security and Conflict Resolution (U)

263 10:50 am

Demographics and Vulnerability Factors of Victims of Sexual Exploitation in Metro Manila, Philippines: A Secondary Data Analysis at San Diego State University

Bridget Stephenson, Social Work (M)

264 11:05 am

Potential Neuroscientific Effects of (Buddhist) Ethical Discipline on a Meditative Practice

Bradley Pierce, Philosophy (U)

265 11:20 am

Food insecurity and access to primary healthcare among sex workers during the COVID-19 pandemic: Findings from a community-based cohort in Vancouver, Canada

Elizabeth Frost, Public Health (D)

Session E-2

Oral Behavioral and Social Sciences 11

Saturday, March 5, 2022, 10:00 am

Location: Legacy Suite

266 10:05 am

Haitian Diaspora in Tijuana: A restaurant as a Migrant Community Resource

Anabel Gutierrez, Latin American Studies (M)

267 10:20 am

Generation Z: Will The Birth Rate Remain The Same?

Kamia Way, Economics (U)

268 10:35 am

Underappreciated Labor: College Students and the Job Search

Anna Kelley, Sociology (U)

269 10:50 am

Designing a Motivational Interviewing intervention for oral health: Literature Review and Formative Interviews

Sabrina Cesare, Interdisciplinary Studies - Biology, Psychology, Business (U)

270 11:05 am

Do Parenting Behaviors Mediate the Relationship Between Parental Mental Health and Child Weight Status?

Angel Chukwu, Public Health - Health Promotion & Behavioral Science (M)

271 11:20 am

Application of RE-AIM Framework on Conmigo, A Physical Activity Program for Latina Mother Daughter Pairs

Michelle West, Public Health - Health Promotion & Behavioral Science (M)

Session E-3

Oral Biological and Agricultural Sciences 5

Saturday, March 5, 2022, 10:00 am

Location: Pride Suite

272 10:05 am

Researching the Binational Distribution of the Desert Mountain Sage and the Genetics of its Subspecies

Eduardo Charvel, Evolutionary Biology (U)

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273 10:20 am
Population dynamics of Agave shawii in Cabrillo National Monument
Paulina Arellano, Biology (U)

274 10:35 am
Taxonomy and Population Genetics of a Barrel Cactus in the Gulf of California
Yazmin Lommel, Biology (M)

275 10:50 am
Resilient restoration of Coast Live Oak in southern California
Vincent Trang, Cellular and Molecular Biology (U)

276 11:05 am
Spiny and Struggling : Reproductive Ecology of a Rare Native Cactus
Niveditha Ramadoss, Evolutionary Biology (D)

Session E-4

Oral Biological and Agricultural Sciences 6
Saturday, March 5, 2022, 10:00 am
Location: Park Boulevard

278 10:05 am
Spore-forming Paraclostridum benzoelyticum from human IBD fecal samples produces a potential toxin specific to Bifidobacterium
Nicole Jacobson, Cellular and Molecular Biology (D)

279 10:20 am
Phage therapy to combat multi-drug resistant persistent infections in cystic fibrosis patients
Hamza Hajama, Cellular and Molecular Biology (M)

280 10:35 am
Identifying the receptors and other factors required by phages that infect Achromobacter species (Achromophages)
Ryan Rowe, Microbiology (M)

281 10:50 am
Investigating the Impact of the Sexually Transmitted Parasite Trichomonas vaginalis and Pyroptosis on the Cervicovavaginal Bacteria Lactobacillus crispatus
Ty'Tianna Clark, Cellular and Molecular Biology (M)

Session E-5

Oral Humanities, History, Literature, Philosophy 5
Saturday, March 5, 2022, 10:00 am
Location: Mata'yuum

282 10:05 am
Yearning to Breathe Free Air: Black Towns in the American West, 1870-1920
Kayla Daniels, History (M)

283 10:20 am
Image Making, Visual Culture, and Abolitionism
Briana Betschart, History (M)

284 10:35 am
Shaping change beyond the carceral: Octavia E. Butler's Parable series as a tool of abolition
Jenna Wilson, Women's Studies (M)

285 10:50 am
Bottles on the Shore: Prohibition in San Diego, California
Alec Whitson, History (M)

Session E-6

Oral Business Economics and Public Administration / Education 3
Saturday, March 5, 2022, 10:00 am
Location: Aztlan

286 10:05 am
Open Innovation Platform Design: The Case of Social Product Development
Vanessa Roy, Management Information Systems (U)

287 10:20 am
Framing the Coast Guard on Social Media: Exploring Organizational Identity, Legitimacy, and Public Perceptions
John Beal, Mass Communication and Media Studies (M)

288 10:35 am
Social Traveling Platform Design - User Experience Study
Ryan Christian Quiba, Management Information Systems (U)

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289 10:50 am

Mapping the Everyday Lives of the Houseless

Julia Stasio, Business (U)

290 11:05 am

SDSU Fall 2019 & Spring 2020 Transportation Survey Report: Reducing Commute Emissions

Rohan Gidvani, Business Finance (U)

291 11:20 am

Limiting Factors of Open Innovation Success: A Case of Social Product Development and Research Agenda

Summer McGuckin, Marketing, Specialization in Integrated Marketing Communications (U)

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Poster Presentations

Friday, March 4, 2022

Sessions F-I

Poster presenters are required to stand by their poster during the entire 1-hour and 30 minute discussion period. Each oral presentation is allotted 10 minutes followed by a 5-minute question and answer period. Participants and guests are asked to enter or leave the rooms only between presentations.

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Friday, March 4, 2022

Session F: Poster Presentations

Session F-1

Poster Behavioral and Social Sciences 12
Friday, March 4, 2022, 9:00 am
Location: Montezuma Halll

292 9:00 am A

Metalinguistic awareness on an English vocabulary task for bilingual college students with and without a history of Developmental Language Disorder

Melissa Separa, Speech, Language and Hearing Sciences (U)

293 9:00 am B

Measuring accuracy of treatment targets through visual analog scales following phonological intervention

Alicia Escobedo, Speech, Language, and Hearing Sciences (D)

294 9:00 am C

Configuration and Engagement During Novel Word Learning in School-Aged Children

Makenna Sine, Speech, Language, and Hearing Sciences (U)

295 9:00 am D

Reliability of Speech Sound Transcriptions in Teletherapy

Amanda Laird, Speech, Language, and Hearing Sciences (U)

296 9:00 am E

Explicit Repetition Priming in Treatment of Anomia

Stephanie Wan, Speech, Language, and Hearing Science (M)

297 9:00 am F

Telepsychiatry for Children and Youth; The Challenges and Benefits

Maryhanna Leraas, Child and Family Development (U)

298 9:00 am G

Exploring Benefit Finding Among Children and Adolescents with Craniofacial Conditions: A Qualitative Analysis

Megan Korhummel, Psychology (U)

Session F-2

Poster Behavioral and Social Sciences 13
Friday, March 4, 2022, 9:00 am
Location: Montezuma Hall

299 9:00 am H

Anxiety and depression in middle-aged and older adults with and without autism spectrum disorder

Elizabeth Fenelon, Psychology (U)

300 9:00 am I

BOLD signal variability and its relationship with cognitive performance and anxiety symptoms in Autism Spectrum Disorder

Naomi Meave Ojeda, Psychology (M)

301 9:00 am J

Links between poor sleep in the first year of life and later neurocognitive outcomes in young children with autism

Adriana Rios, Psychology (U)

302 9:00 am K

Examining the Relationship between Childhood Trauma and Anxiety in Older Adults

Cassandra Ortiz-Nelsen, Public Health (U)

303 9:00 am L

Distress Amongst Latina Breast Cancer (BC) Patients During the COVID-19 Pandemic

Andrea Valadez Galindo, Social Work (M)

304 9:00 am M

Zoom University: How the pandemic and online learning has affected SDSU students

Shayan Ebadat, Communication (U)

305 9:00 am N

Associations between Life's Simple 7 & White Matter Microstructures in Middle-Age and Early-Old Age

Teresa Warren, Psychology (U)

306 9:00 am O

Arthropod community responses to bison and prescribed fire management in tallgrass prairies

Maricela Alaniz, Biology (U)

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Session F-3

Poster Biological and Agricultural Sciences 7

Friday, March 4, 2022, 9:00 am

Location: Montezuma Hall

307 9:00 am P

Site age and recent fire influence decomposition more than plant litter source in restored tallgrass prairies

Mareike Lankhorst, Biology (U)

308 9:00 am Q

Arctic Permafrost Thaw Depth and Water Table Trends: A Comparison Over Time and Between Sites

Nina Chesnut, Cellular and Molecular Biology (U)

309 9:00 am R

Chaparral Management Plan of Southern California

Ben Hall, Environmental Sciences (U)

310 9:00 am S

Bridging the “Conservation Gap” with Population Genetics

Anais Aoki, Bioinformatics and Medical Informatics (M)

311 9:00 am T

Temporal Assessment Of Tobacco Related Compounds (Nicotine and its metabolites) In California Natural Reserve

Shahrin Binte Salam, Environmental Health (M)

312 9:00 am U

What’s for dinner? Prey selection of the California spiny lobster

Crisila Aban, Biology (U)

Session F-4

Poster Biological and Agricultural Sciences 8

Friday, March 4, 2022, 9:00 am

Location: Montezuma Hall

313 9:00 am V

Heritability and phenotypic plasticity of body size in the parthenogenetic wasp Dinocampus coccinellae

Scott Monahan, Biology (U)

314 9:00 am W

Dried plum bone formation biomarkers in human fecal and plasma samples using high resolution mass spectrometry

Kayla Mari Vale Cruz, Chemistry with an emphasis in Biochemistry (U)

315 9:00 am X

STIs on the Move: Investigating the Role of Motility in Trichomonas vaginalis Pathogenesis

Mariana Padilla, Biology (U)

316 9:00 am Y

Microbiome and virome analysis reveals distinct differences in IBD communities versus healthy communities

Cole Souza, MS Microbiology (M)

317 9:00 am Z

Application of Constant Tensional Force Radiating from Nipple and Overlying Skin Alters Mammary Ductal Branching Morphogenesis in Mice

Daisy Ulloa, Mathematics, Emphasis in Computational Science (U)

318 9:00 am AA

Effects of UV on Antioxidant Production in Hydroponically Grown Phaseous vulgaris

Marley Wilson, Environmental Science (U)

319 9:00 am BB

Battle of the Sexes: A Closer Look into Cylindropuntia wolfii’s Sexual System

Scarlet Steele, Biology and Philosophy (U)

Session F-5

Poster Engineering and Computer Science 5

Friday, March 4, 2022, 9:00 am

Location: Montzuma Hall

320 9:00 am CC

Study of Bench Scale Anaerobic Digesters for the development of improved onsite and mobile sanitation solutions

Elijah Sowunmi, Mechanical Engineering (U)

(U) = Undergraduate; (M) = Masters; (D) = Doctoral

321 9:00 am DD
Cultivating Anammox Bacteria Using an Anaerobic Baffled Reactor to Effectively Treat Wastewater
Elisa Rivera, Environmental Engineering (U)

322 9:00 am EE
Photoirradiation and degradation kinetics of tire wear particle (TWP) leachates
Kelly Hollman, Civil Engineering, concentration in Environmental Engineering (M)

323 9:00 am FF
Building-level wastewater surveillance for COVID-19: Building a model for predictive epidemiology
Julia Arvizu, Civil Engineering (U)

324 9:00 am GG
Hydraulic Modeling of Vegetation Restoration and Disturbance in Alvarado Creek
Trevor Eckermann, Environmental Engineering (U)

325 9:00 am HH
Modeling the effects of fire and vegetation management on flooding and sediment transport in an urban stream system
Danielle Hunt, Civil Engineering – Water Resources (M)

326 9:00 am II
Recovery of Vegetation Biomass after the 2012 Waldo Canyon Fire in Colorado
Emily Andreano, Environmental Engineering (U)

Session F-6

Poster Physical and Mathematical Sciences 3
Friday, March 4, 2022, 9:00 am
Location: Montezuma Hall

327 9:00 am JJ
The Impact of Inter-Region Mobility on the Reproduction Numbers of COVID-19 in San Diego County
Abbey Rosario, Statistics (U)

328 9:00 am KK
Modeling the effects of nanoparticle-based therapy in controlling SARS-COV-2 infection
Zhibin Chang, Applied Mathematics (U)

329 9:00 am LL
Modeling Within-Host Dynamics of SARS-CoV-2 Infection: A Case Study in Ferrets
Angelica Bloomquist, Computational Science (D)

330 9:00 am MM
Modeling Spatio-temporal distribution of HIV particles on cervicovaginal mucus and nanoparticle-based preventive therapy
Anuradha Agarwal, Computational Science (M)

331 9:00 am NN
Modeling and cluster analysis of drug combinations to control HIV infection in the brain
Audrey Oliver, Biology (U)

332 9:00 am OO
Modeling the Temperature-Dependent Microbiome Composition Leading to Black Band Disease of Coral Reef
Alex Busalacchi, Applied Math (M)

333 9:00 am PP
The Added Benefit of CT-Based Histograms for COPD Diagnoses
Jeremy Tran, Statistics (M)

Session F-7

Poster Health Nutrition and Clinical Sciences 3
Friday, March 4, 2022, 9:00 am
Location: Montezuma Hall

334 9:00 am QQ
Developmental exposures to non-nutritive sweeteners impact pancreatic development in the zebrafish, Danio rerio
Lily Harrison, Biology (U)

335 9:00 am RR
The Effects of Prune Extract on Cellular Models of Bone Cancer
Chelsie Miller, Foods and Nutrition (U)

336 9:00 am SS
Fruits, Gut, and Human Health
Apryl Hazle Stepp, Foods & Nutrition (U)

337 9:00 am TT
Pharmacological suppression of the sweet receptor T1R3 impacts larval growth and pancreatic islet development in the zebrafish, Danio rerio
Christine Cho, MS in Environmental Health (M)

Session F-8

Poster Business Economics and Public Administration / Education 4
Friday, March 4, 2022, 9:00 am
Location: Montezuma Hall

338 9:00 am UU
An Analysis of the Food Landscape of San Diego County
Lauren Padden, Marketing (U)

339 9:00 am VV
Digital Innovation Potency in SMEs
Vincent Tran, Information Systems (U)

340 9:00 am WW
Student Research for Equity in Representation in Mathematics
Marlene Marin-Alcantar, Dual Language and English Learner Education: Critical Literacy & Social Justice (M)

341 9:00 am XX
Examining the perceptions of, first-generation college students from Barrio Logan College Institute
Miriam Garcia, Biology (U)

342 9:00 am YY
K-5 Teachers' Attitudes toward Queer Children's Literature in the Classroom
Kris Bell, Education (D)

Friday, March 4, 2022

Session G: Poster Presentations

Session G-1

Poster Behavioral and Social Sciences 14
Friday, March 4, 2022, 11:00 am
Location: Montezuma Hall

343 11:00 am A
Officer Involved Homicides: the Influence of Race Composition
Isis Venner, Interdisciplinary Studies: Sociology, Psyhology, Africana Studies (U)

344 11:00 am B
Using Social Disorganization Theory to Understand Police-Community Interaction in a Multi-Ethnic City: A Quantitative Study on Police Behavior in San Diego
Sheridamae Gudez, Criminal Justice and Criminology (M)

345 11:00 am C
Emerging Concepts in Neuroethics and Neurosecurity Through Lenses of Identity, Diversity, Autonomy, and Agency
Sophie Koehler, Mechanical Engineering (U)

346 11:00 am D
The Context Diversity of Where People Lived the Longest Predict Implicit Associations between American and Ethnic Identities
Lisandra Dobson, Psychology (M)

347 11:00 am E
Pilot Testing a Field Assessment Tool to Assess Inequity in Public Restroom Access and Quality
Sara Rodrigue, Public Health (U)

348 11:00 am F
End Poverty Dashboard: A look into Homelessness and the SDGs in San Diego County, California
Nasser Mohieddin, Big Data Analytics (M)

349 11:00 am G
Involving caregivers in telepractice assessment: Creating a culturally appropriate orientation
Elise Ramirez, Speech, Language, and Hearing Sciences (U)

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Session G-2

Poster Behavioral and Social Sciences 15
Friday, March 4, 2022, 11:00 am
Location: Montezuma Hall

350 11:00 am H
Racial/Ethnic and Gender Differences of Cigarette Smoking Rates: California Compared to Tobacco Growing States
Amber Davis, Public Health (U)

351 11:00 am I
Internalized stigmas and substance use among sexual minority men
Eduardo Hernandez Mozo, Biology and Psychology (U)

352 11:00 am J
The Role of Social Determinants of Health in Veteran Suicide: A Systematic Literature Review
Ray Cameron Vialu, Public Health- Health Promotion and Behavioral Sciences (M)

353 11:00 am K
Generational effects of stigma, trauma, and mental illness within the youth in East African Communities
Nyakoach Lam, Social Work (M)

354 11:00 am L
Qualitative analysis of the impact of socioeconomic factors on eating disorder risk among transgender and gender diverse young adults
Catalina Torres, Public Health (U)

355 11:00 am M
A Comparative Evaluation of Behavioral Questionnaire Use in the FASD-Tree
Chloe Sobolewski, Psychology (U)

Session G-3

Poster Biological and Agricultural Sciences 9
Friday, March 4, 2022, 11:00 am
Location: Montezuma Hall

356 11:00 am N
Study and Characterization of Metamorphosis Inducing Factor 1 (Mif1) in Pseudoalteromonas luteoviolacea
Carl Westin, Microbiology (M)

357 11:00 am O
Assessing Acute Toxicity and Reproductive Success of Marine Invertebrates such as Artemia Salina when exposed to TCPM and TCPMOH
Tatiana Bok, Environmental Science (U)

358 11:00 am P
The marine contaminant Tris(4-Chlorophenyl) Methane (TCPM) impairs embryonic development and disrupts gene expression in zebrafish embryos
Jessica Yost, Public Health with an emphasis in Environmental Health Sciences (M)

359 11:00 am Q
Tris(4-chlorophenyl)methane (TCPM) and Tris(4-chlorophenyl)methanol (TCPMOH) disrupt pancreatic organogenesis and gene expression in zebrafish embryos
Peyton Wilson, Environmental Health (M)

360 11:00 am R
A Characterization of the Microbes and Viruses Present in the Tijuana River and Estuary to Elucidate Potential Pathogens
Nicholas Allsing, Biology (Molecular Biology) (M)

361 11:00 am S
Environmental fate and transport of cigarette butt leachate chemicals in a marine environment
Christine Stewart, Environmental Health Sciences (M)

362 11:00 am T
Developing New CRISPRi toolkit for Marine Bacteria
Alpher Aspiras, Cell and Molecular Biology (U)

Session G-4

Poster Biological and Agricultural Sciences 10
Friday, March 4, 2022, 11:00 am
Location: Montezuma Hall

363 11:00 am U
Investigation of the DNA Damage Host Response during Parasitic Infection with the Sexually Transmitted Parasite Trichomonas vaginalis
Remicia Germeille, Biology (U)

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364 11:00 am V
The kinetic mechanisms of isocitrate dehydrogenase 1 (IDH1) mutants
Rachel Khoury, Chemistry and Certificate of the American Chemical Society (U)

365 11:00 am W
Investigating the role of motility in Trichomonas vaginalis pathogenesis
Bryn Baxter, Microbiology (U)

366 11:00 am X
Clust-Tree: an automatic partitioning of phylogenetic tree and identification of unique MSA features
Adrian Ortiz Velez, Biological and Medical Informatics (M)

367 11:00 am Y
An R Package for Estimation of Pairwise Genetic Relatedness
Khuyen Nguyen, Bioinformatics (M)

368 11:00 am Z
Utilizing Drosophila to investigate the genes behind DiGeorge Syndrome
Brenna Blotz, Biology (U)

369 11:00 am AA
Study of the 3D Molecular Structure of Viral Capsid Building Blocks
Caitlin Bartels, Biology (U)

Session G-5

Poster Engineering and Computer Science 6
Friday, March 4, 2022, 11:00 am
Location: Montezuma Hall

370 11:00 am BB
Stormwater Effects on Drainage Channels
Patrick Fassell, Civil Engineering (U)

371 11:00 am CC
Water Table Experiment: Interaction of a cloud of particles with a hydraulic jump
Benny Jaime, Aerospace Engineering (U)

372 11:00 am DD
Analysis of Pressure and Flow Control on a Truncated Linear Aerospike Nozzle
Jarred Sampayan, Aerospace Engineering (U)

373 11:00 am EE
Testing of Synthetic Jet Actuators in an Airfoil
Charles Duddy, Aerospace Engineering (U)

374 11:00 am FF
Consensus-Based Decentralized Auctions for Robust Task Allocation in Urban Air Mobility
Nicholas Agtual, Mechanical Engineering (U)

375 11:00 am GG
5G Broadband (4.5-55GHz) High Gain Balanced Antipodal Vivaldi Antenna with 3D Lens
Helena Clavin, Electrical Engineering (U)

376 11:00 am HH
Dual Circular Polarized Wideband Stacked Patch Flat Panel Phased Array Antenna for Ka-Band Applications
Rudraishwarya Banerjee, Computational Science (D)

Session G-6

Poster Physical and Mathematical Sciences 4
Friday, March 4, 2022, 11:00 am
Location: Montezuma Hall

377 11:00 am II
Optimization of the detection of nicotine in third-hand smoke residues via colorimetric detection
Sergio Renteria, Biochemistry (U)

378 11:00 am JJ
Study of New AOMedia Video 1 Codec Compression Settings for Future Wireless Streaming
Evan Ballesteros, Computer Science (U)

379 11:00 am KK
Highest Rated Films Over a Thirty Year Period: A Statistical Analysis of the Significant Predictors of a Film’s Rating
Mariela Ponce, Mathematics (U)

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380 11:00 am LL

Uncertainty Quantification in Nuclear Interactions

Ky Putnam, Physics (U)

381 11:00 am MM

Using Machine Learning Models to Predict Function Values

Erika Gutierrez, Mathematics Single Subject Teaching (U)

382 11:00 am NN

A Brief Introduction to Microwave Quantum Optics

Malida Hecht, Physics (M)

383 11:00 am OO

Statistical Analysis of Stable Nuclei Collision

Nathaniel Saavedra, Physics (U)

Session G-7

Poster Health Nutrition and Clinical Sciences 4

Friday, March 4, 2022, 11:00 am

Location: Montezuma Hall

384 11:00 am PP

Factors Affecting Attrition from Telehealth Among Older Adults

Tiffany Chin, Public Health-Health Management and Policy (M)

385 11:00 am QQ

Impact of COVID-19 pandemic restrictions on the start of treatment after cancer diagnosis for patients enrolled in IRB approved study at UC San Diego, Moores Cancer Center Biorepository

Matyas Hanna, Microbiology (U)

386 11:00 am RR

Parental Attitudes on Genetic Testing on Pediatric Cancer Patients

Sydney Olfus, Biology (U)

387 11:00 am SS

Recommendation of HPV Vaccine to Hesitant Parents: Pediatrics versus Family Medicine Providers

Shakirah Williams, Public Health (U)

388 11:00 am TT

Measuring food insecurity in Latinx families: expanding understanding of their experiences through exploratory interviewing and cognitive testing

Brianna Flores, Foods and Nutrition (U)

389 11:00 am UU

Food cravings are mediated by sensory mental imagery in reward sensitive adults

Kyra Jensen, Foods and Nutrition (U)

390 11:00 am VV

The Impact of Pre-existing Dementia on Lung Cancer Treatment Decisions among Older Adults (65+)

Shivani Patel, Health Management & Policy (M)

Session G-8

Poster Humanities, History, Literature, Philosophy / Creative Arts and Design 6

Friday, March 4, 2022, 11:00 am

Location: Montezuma Hall

391 11:00 am WW

Social Justice Conflict and Family Dynamics

Katherine Chen, Communication & Liberal Studies (U)

392 11:00 am XX

How to use history as a guide to forestall our inevitable collapse?

Savannah Castleman, Anthropology (U)

393 11:00 am YY

Humanitarian Critique of the Economic Sanctions on Cuba

Ysabel Gonzalez, Political Science (M)

394 11:00 am ZZ

Sending It ‘Round Again

Cynthia Bloodgood, Master of Fine Arts in Technical Direction (M)

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Friday, March 4, 2022
Session H: Poster Presentations

Session H-1

Poster Behavioral and Social Sciences 16
Friday, March 4, 2022, 1:00 pm
Location: Montezuma Hall

395 1:00 pm A
Social Determinants of Health and Veteran Suicide: An Application of California Health Interview Survey Data
Eamonn Hartmann, Public Health (M)

396 1:00 pm B
Comparing Suicidality and Attachment Styles within a Sample with Adverse Childhood Experiences
Shea O'Donnell, Psychology (U)

397 1:00 pm C
The Association Between Economic Stress and Episodic Memory
Samantha Rae, Psychology and History (U)

398 1:00 pm D
Sexual orientation and Self-rated health
Savannah Taylor, Sociology (M)

399 1:00 pm E
Examining the Emotional Labor Performed by Probation and Parole Staff
Alexandra Spencer, Criminal Justice and Sociology (U)

400 1:00 pm F
The Effect of Adverse Childhood Experiences on Perceived Discrimination
Alejandra Gonzalez, Psychology (U)

Session H-2

Poster Behavioral and Social Sciences 17
Friday, March 4, 2022, 1:00 pm
Location: Montezuma Hall

401 1:00 pm G
Mother's vs. Father's parenting strategies influence regarding Latina daughter's PA levels
Maryam Aso, Criminal Justice (U)

402 1:00 pm H
Improving Program Attendance Among Latina Mothers And Daughters
Loany Osorio, Psychology (U)

403 1:00 pm I
Identifying and Improving Low Engagement in Online Physical Activity Programs Among Latina Youth: What can we do to make it more fun and engaging for them?
Fernanda Cardona, Speech, Language, & Hearing Sciences (U)

404 1:00 pm J
Depressive Media: Internet use and Depression
Steve Benitez, Sociology (M)

405 1:00 pm K
Impact of Social Media Follower and Like Count on Body Satisfaction
Grace Weatrowski, Psychology (U)

406 1:00 pm L
Effect of food cue exposure on dietary intake and related markers among adults with overweight and obesity
Monica Wilson, Food Science and Nutrition (U)

Session H-3

Poster Biological and Agricultural Sciences 11
Friday, March 4, 2022, 1:00 pm
Location: Montezuma Hall

407 1:00 pm M
Developing A Novel Wnt Mimetic Using TCDB
David Anjakos, Molecular and Cellular Biology (U)

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408 1:00 pm N
Kinetic properties of heterodimeric IDH1
Elene Albekioni, Chemistry and Biochemistry (D)

409 1:00 pm O
Detection of nucleic acids using the CRISPR/Cas system and single-molecule imaging techniques
Stephanie Silva, Biochemistry (M)

410 1:00 pm P
Exploring the mechanisms of IDH1 pH sensitivity
Nicole Sierra, Biochemistry (U)

411 1:00 pm Q
Untargeted Lipidomics in U87-MG Glioma Cells
Grace Chao, Cell and Molecular Biology (D)

412 1:00 pm R
Using NMR Spectroscopy to Trace 15N-Isoptopes through an Engineered Food
Tuan Le, Biochemistry (M)

413 1:00 pm S
DNA Polymerase ε: An Investigation of an Exonuclease Mutation
Brittany Bermoy, Biochemistry (M)

Session H-4

Poster Biological and Agricultural Sciences 12
Friday, March 4, 2022, 1:00 pm
Location: Montezuma Hall

414 1:00 pm T
Evaluating Racial, Ethnic, and Gender Differences in Immune-Related Adverse Events in Patients Treated with Immune Checkpoint Inhibitors
Thomas Luu, Biology (U)

415 1:00 pm U
Dynamic transcriptional changes in the adult Drosophila central nervous system highlights potential coordination of stress and repair responses following traumatic brain injury
Eddie Cho, Bioinformatics and Medical Informatics (M)

416 1:00 pm V
Short-Term Exercise Blunts Vaping Induced Pulmonary Injury
Pria Bose, Cellular and Molecular Biology (U)

417 1:00 pm W
TWEAK/Fn14 Axis Promotes a Stem-like Phenotype Contributing to Ovarian Cancer Relapse
Ryne Holmberg, Biochemistry (D)

418 1:00 pm X
Optimizing derivation of decidual-type natural killer cells (dNK) from induced pluripotent stem cells (iPSC)
Carly DaCosta, Interdisciplinary Studies (U)

419 1:00 pm Y
Establishing the Role of the Conserved TN Domain in Tinman
Cayleen Bileckyj, Cell and Molecular Biology Joint Doctoral Program (D)

420 1:00 pm Z
The Role of IGFBP5 in Ovarian Cancer
Ixchel Urbano, Biology, Cellular and Molecular Biology Emphasis (U)

Session H-5

Poster Engineering and Computer Science 7
Friday, March 4, 2022, 1:00 pm
Location: Montezuma Hall

421 1:00 pm AA
Manufacture of Glassy Carbon Transistor (GCT) for Increased Sensitivity of Neural Activity/μECOG Signals
David Trejo-Rodriguez, Bioengineering (M)

422 1:00 pm BB
Advancements in the Visualization of Auditory Stimulus in Songbirds Using Novel Epicortical and Intracortical Neural Probes
Matthew Dacayo, Mechanical Engineering emphasis in Bioengineering (U)

423 1:00 pm CC
Effect of LVAD outflow graft diameter on flow pulsatility in the aortic arch
Britton Mennie, Mechanical Engineering - Emphasis in Bioengineering (U)

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424 1:00 pm DD
Effects of Pulsatility and Outflow Graft Diameter on Aortic Arch Flow with a LVAD
Aubrey Benjamin, Mechanical Engineering with emphasis in Bioengineering (U)

425 1:00 pm EE
Studying the diagnostic value of CT images in COPD through convolutional neural networks
Amanda Lee, Computational Science (D)

426 1:00 pm FF
Hospital Classification Analysis
Joseline Ayala, Big Data Analytics (M)

427 1:00 pm GG
Fall Prediction and Detection in At-Risk Older Adults through Inferencing at the Edge
Jingxiao Tian, Electrical & Computer Engineering (D)

Session H-6

Poster Physical and Mathematical Sciences 5
Friday, March 4, 2022, 1:00 pm
Location: Montezuma Hall

428 1:00 pm HH
Large-scale synthesis of a fluorescent probe for specific DNA and RNA sequences
Esteban Mora, Biochemistry (U)

429 1:00 pm II
Total Synthesis of Palmyramide A
Jessica Lang, Chemistry (U)

430 1:00 pm JJ
Modeling Protein-Protein Interactions Between Mitochondrial Malate Dehydrogenase and Citrate Synthase
Analisa Ballesteros, Chemistry-Emphasis in Biochemistry (U)

431 1:00 pm KK
Total Synthesis of Carmophycin X: A Potent Anti-Cancer Drug
Danielle Johnson, Chemistry (U)

432 1:00 pm LL
Preparation of Functionalized Potassium Alkenyl Trifluoroborate Compounds via Hydroboration of Terminal Alkynes
Stephanie Pinedo, Chemistry (M)

433 1:00 pm MM
Potential Benefits of Azetidine- Substituted Fluorescent Nucleobase Analogues
Christina Rivera, Biochemistry (U)

434 1:00 pm NN
Evaluating the detection of fluorescently labeled amino acids in deep eutectic solvents
Karen Campos, Chemistry (U)

Session H-7

Poster Health Nutrition and Clinical Sciences 5
Friday, March 4, 2022, 1:00 pm
Location: Montezuma Hall

435 1:00 pm OO
Accuracy of a Predictive Core Body Temperature Formula During Exercise in Heat Stress in Healthy Adults
Robert Castro, Exercise Physiology & Nutritional Science (M)

436 1:00 pm PP
Effects of Exercise Intensity on Cardiometabolic Health in Individuals with Spinal Cord Injuries (SCI): a Systematic Review
Jacqueline Erdkamp, Kinesiology Pre-Physical Therapy (U)

437 1:00 pm QQ
Impacts of Almonds on Physical Activity
Maricarmen Cervantes, Public Health (U)

438 1:00 pm RR
Noise Exposure in Undergraduate Student Musicians
Carly Hunt, Speech, Language, and Hearing Sciences (U)

439 1:00 pm pm SS
Vietnamese classifiers in stories: Case examples from children with and without language disorder
Khanh Nguyen, Speech, Language, Hearing Sciences (M)

440 1:00 pm TT
Speech-Monitoring in Overt Language Production
Coral Rodriguez, Speech Language and Hearing Sciences (U)

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Session H-8

Poster Interdisciplinary 1
Friday, March 4, 2022, 1:00 pm
Location: Montezuma Hall

441 1:00 pm UU
Chemical leachates from cigarette butt litter impair embryonic development in the zebrafish, Danio rerio
Isabella Sardo, Public Health (U)

442 1:00 pm VV
Infiltration and soil moisture variability in Alvarado Creek
Gabriel Goncalves-Santana, Geology (U)

443 1:00 pm WW
Measuring the Impact of Arundo donax on Infiltration Processes
Kathryn Tippett, Mechanical Engineering (U)

444 1:00 pm XX
Persistence, Removal, and Transformation Products of Trace Organic Compounds in Sunlight-Exposed Secondary Wastewater Effluent
Thomas Morales, Environmental Health (M)

445 1:00 pm YY
A Non-targeted Analysis of Tobacco-related Compounds Within the Kendall Frost Reserve
Melissa Pennington, Public Health - Environmental Health (M)

Friday, March 4, 2022
Session I: Poster Presentations

Session I-1

Poster Behavioral and Social Sciences 18
Friday, March 4, 2022, 3:00 pm
Location: Montezuma Hall

446 3:00 pm A
The Urban Sustainability, Livability, and Equity
Arman Ogandzhanyan, Urban Planning Design & Management (U)

447 3:00 pm B
Mapping the Everyday Lives of the Houseless
Michael Rumfola, Sustainability (U)

448 3:00 pm C
A Maize of Causation: A Bioarchaeological Case Study of Nasal Fractures and Agricultural Intensification
Megan Carey, Anthropology (M)

449 3:00 pm D
Across-agency partnerships and within-agency capacities shape how stakeholder agencies address food insecurity: perspectives of key informants in San Diego County
Lani Morales, Exercise and Nutritional Sciences (M)

450 3:00 pm E
COVID-19 Vaccine Hesitancy among Mexican-Americans in the Imperial Valley
Andrea Van Bebber, Psychology (U)

451 3:00 pm F
County-Level Political Orientation Predicts Implicit Bias against Native Americans
Nancy Moreno, Psychology (M)

452 3:00 pm G
Aging out of dependent coverage and health insurance trends
Brittney Seidemann, Public Health: Health Management and Policy (M)

Session I-2

Poster Behavioral and Social Sciences 19
Friday, March 4, 2022, 3:00 pm
Location: Montezuma Hall

453 3:00 pm H
Odor Identification Score, ApoE e4 Status, and Age are Associated with Thickness of Medial Temporal Lobe Structures
Conner Frank, Clinical Psychology (D)

454 3:00 pm I
Examining Discrepancies between Self and Informant Ratings from the Social Responsiveness Scale in Adults with ASD
Mira Wittenberg, Psychology (U)

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455 3:00 pm J
Lived Experiences of Young-Adult Spanish-English Bilinguals with and without Developmental Language Disorder
Halie Shea Doan, Speech Language Hearing Sciences (U)

456 3:00 pm K
Recognition Errors when Learning Novel Words
Amber Henmi, Speech Language and Hearing Sciences (U)

457 3:00 pm L
Piloting an online study to assess Knowledge Learning, Inhibition, and Comprehension in young children
Selena Llanes, Speech, Language, & Hearing Sciences (U)

458 3:00 pm M
Experiences of speech-language pathologists in the Philippines
Danielle Guevarra, Speech, Language, and Hearing Sciences (M)

459 3:00 pm N
An electrophysiological megastudy of object recognition
Sofia Ortega, Psychology (U)

Session I-3

Poster Behavioral and Social Sciences 20
Friday, March 4, 2022, 3:00 pm
Location: Montezuma Hall

460 3:00 pm O
Bringing PrEP Well to Scale: Qualitative Insights to Inform Implementation of Comprehensive PrEP Services in a Trans Community Center in Los Angeles
Hannah Reynolds, Public Health (U)

461 3:00 pm P
Patient and Provider Perceptions on the Acceptability and Feasibility of a Pilot Program Screening and Linking Patients to PrEP Services in Primary Care
Sandhya Muthuramalingam, Public Health (U)

462 3:00 pm Q
Intergenerational Reproductive Health Communication Among Salvadoran Mother and Daughter Dyads
Melissa Vasquez Rosales, Public Health /Latin American Studies (M)

463 3:00 pm R
Smoking-Related Health Risks Among Arab Americans in California
Merna Nissan, Biology (U)

464 3:00 pm S
Goal Setting Theory in a Digital Setting
Elizabeth Springer, Psychology (U)

465 3:00 pm T
TiO2 protected NIFe catalyst for stable water and glycerol oxidation
Alexia Reyes, Chemistry (U)

Session I-4

Poster Biological and Agricultural Sciences 13
Friday, March 4, 2022, 3:00 pm
Location: Montezuma Hall

466 3:00 pm U
Analysis of β-glucuronidase, β-galactosidase, and α-galactosidase on eight bacteria
Shawn Ogden, Cell and Molecular Biology (M)

467 3:00 pm V
Using ChIP-seq to identify genes regulated by RelA or RelB that support ovarian cancer tumor-initiating cell (TIC) characteristics
Emily Mu, Cell & Molecular Biology (M)

468 3:00 pm W
β-glucuronidase activity in murine gut microbiota
Laura Sisk-Hackworth, Cell and Molecular Biology (D)

469 3:00 pm X
CRISPR screen to identify BAF subunits required for stem cell maintenance and pluripotency
Ryan McCubbin, Cell and Molecular Biology (M)

470 3:00 pm Y
Fundamentals of Vaping-Associated Pulmonary Injury Leading to Severe Respiratory Distress
Abbie Rieder, Biology (U)

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471 3:00 pm Z
Anchoring Metal Halide Perovskite Nanocrystals on Single-Wall or Multi- Wall Carbon Nanotubes for CO2 Photoreduction
Cassidy McCallum, Chemistry (U)

472 3:00 pm AA
Bifunctional phosphines bearing oxygenated substituents, and their metal complexes for anti-Markovnikov addition of hydroxylic compounds to alkenes
Elguja Gojiashvili, Chemistry (D)

473 3:00 pm BB
Analysis of the links between bound divalent cation and a 10 helix conformation in x-ray crystal structures of human and mouse isocitrate dehydrogenase I
Marissa Balagtas, Biochemistry (U)

Session I-5

Poster Engineering and Computer Science 8
Friday, March 4, 2022, 3:00 pm
Location: Montezuma Hall

474 3:00 pm CC
Impact Efficacy of Polyurea Foams for Biomechanical Applications
Yazeed Kokash, Mechanical Engineering (D)

475 3:00 pm DD
Sensitivity Analysis of Geometric Imperfection Sources in Aluminum Honeycomb Cores on Compression Mechanical Behavior
Adrian Rivera, Structural Engineering (D)

476 3:00 pm EE
Analysis of Ply Transition Regions in Metal/CFRP Hybrid Composite Laminates
Rommel Pineda, Aerospace Engineering Structural Mechanics (M)

477 3:00 pm FF
Modeling Failure of Carbon Fiber Polymer Matrix Laminate Composites with Ply Waviness Defects
Jarod Heise, Aerospace Engineering (M)

478 3:00 pm GG
Numerical Nonlinear Analysis of Reinforced Concrete Structures
Stephania Moreno, Civil Engineering (Structural) (M)

479 3:00 pm HH
Developing a framework for prioritizing safety improvement projects for bicycle facilities using crowdsourced data
Amir Reza Sadeghi, Civil Engineering (Transportation Engineering) (M)

480 3:00 pm II
Fuel-Optimal Powered Descent for Human Mars Missions
Kaylin Borders, Aerospace Engineering (U)

Session I-6

Poster Physical and Mathematical Sciences 6
Friday, March 4, 2022, 3:00 pm
Location: Montezuma Hall

481 3:00 pm JJ
Investigation of the Mechanism of Growth of Silver Nanoparticles through Determination of Chemical Intermediates
Jenna Mulligan, Chemistry (U)

482 3:00 pm KK
Kinetic characterization of Human DNA Polymerase
ε
Isaac Marquez, Biochemistry (M)

483 3:00 pm LL
Connecting Searches to Scorches: Evaluating how people across California interact with the topics of wildfire and air quality through Google searches
Elizabeth Mayes, Geography (M)

484 3:00 pm MM
Identifying active sites on Co3O4 electrocatalyst during the glycerol oxidation through in situ Raman spectroscopy
Gonto Johns, Chemistry (M)

(U) = Undergraduate; (M) = Masters; (D) = Doctoral

485 3:00 pm NN

Downscaling Southern California's Future Climate

William Nicewonger, Geography (U)

486 3:00 pm OO

Investigating The Unique Light-curve of Nova Her 2021

Madeline Overton, Astronomy (U)

487 3:00 pm PP

Lithium Extraction from Geothermal Brine via Indirect Capillary Zone Electrophoresis

Savannah Orth, Chemistry (U)

Creative Arts Exhibits and Presentations

Friday, March 4, 2022

Sessions J and K

Poster presenters are required to stand by their poster during the entire 1-hour and 30 minute discussion period. Each oral presentation is allotted 10 minutes followed by a 5-minute question and answer period. Participants and guests are asked to enter or leave the rooms only between presentations.

San Diego State University

(U) = Undergraduate; (M) = Masters; (D) = Doctoral

Friday, March 4, 2022

Session J: Creative Arts Exhibits

Session J-1

Exhibit 1
Friday, March 4, 2022, 9:00 am
Location: Montezuma Hall

488 9:05 am (Table 2)
Intuitive Recycling: Importance of waste receptacle design & application
Joshua Tanida, Multimedia (U)

489 9:20 am (Table 1)
American Hero
Alexander Zimmerman, Master of Fine Arts (M)

Friday, March 4, 2022

Session K: Creative Arts Presentations

Session K-1

Performance Arts Performance Arts 1
Friday, March 4, 2022, 11:00 am
Location: Montezuma Theater

490 11:05 am
Latinas in San Diego Informal economies during the COVID-19 pandemic
Nancy Bahena, Women's Studies (M)

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Abstracts of Presentations

Session A

(U)=Undergraduate; (M)=Masters; (D)=Doctoral

Session A-1

Oral Behavioral and Social Sciences 1

Friday, March 4, 2022, 9:00 am

Location: Park Boulevard

100 9:05 am

Chronically Online: An Analysis of Parasocial Relationships

Shaylee Anderson, Communication (U)

With the constant development and innovation of new technology, media consumption becomes more commonplace every day. While technology usage and media consumption has been on a steady increase for decades, there has been a growing need for people to be able to develop and maintain relationships that can be sustained strictly through online platforms (this can be seen especially as a result of COVID-19). An online relationship in which a person develops and maintains a connection with a media personality despite having limited interactions with them- if any at all- is known as a parasocial relationship (PSR). Though parasocial relationships may lack qualities that most of our relationships grant us, they often follow the same developmental and maintenance trends, serve similar purposes, and can be examined and monitored in the same way as in-person social relationships. The purpose of this study is to analyze factors of attraction that initiate the development of parasocial relationships, maintenance behaviors that sustain them, and how they compare to in-person social relationships.

101 9:20 am

Understanding the Effects of Misinformation: Reaching the Communities at Risk

Ricardo Duarte, Social Work (M)

Background: The purpose of this study is to explore the potential effects of misinformation on how informed different populations are on current social, political, and health-related events that may impact their utilization of social services. With the current focus on the effects of social media on world events, the rise of misinformation has been documented and has led to the support of social movements based on information categorized as false. Misinformation is content that has been fact-checked, poorly sourced, and stemming from a dubious source.

Methods/Results: This study hypothesizes that individuals engaged with social media and with conservative-leaning political ideologies are most at risk of the detrimental effects of misinformation. Therefore, the study investigates which California communities experience exposure to misinformation through the utilization of Teunisse et al.’s two scales regarding trust and gullibility, used in similar studies on misinformation. Surveys were administered to 80 participants from August 2021-February 2022 with participation restricted to residents of California, 18 years of age or older. Participants were recruited through social media platforms Facebook, Reddit, TikTok, Instagram, Twitter, and Parler. Furthermore, participants of diverse social backgrounds were recruited for this study. Usage of traditional and non-traditional media is analyzed to examine the associations between misinformation, trust, and gullibility. Utilizing bivariate and multiple regression analyses.

Conclusion: This study has implications for social work and healthcare providers to understand the effects of misinformation on different communities' perceptions of their environments in order to better reach and serve these communities.

(U) = Undergraduate; (M) = Masters; (D) = Doctoral

102 9:35 am

Girlhood and Mental Health: Representations in Media

Emily Teaze, Interdisciplinary Studies in Three Departments (English, Women's Studies, Art-Illustration and Drawing) (U)

This research was done in order to convey the impact of television, particularly the Netflix original show 13 Reasons Why (2017), on girlhood and mental health. The reasoning behind this research was due to my own experiences regarding girlhood and mental health issues coinciding with 13 Reasons Why which aired when I was a teenager. In my experience, mental health issues were either overshadowed by preconceived notions of femininity, such as being overly sensitive, or they were focused on suicide ideation without looking at possible deeper mental health diagnoses, both depicted in 13 Reasons Why. Some context for this research consists of defining the terminology, such as suicide ideation, the act of thinking or planning suicide, and suicide contagion, regarding the issue of “copycat” suicide. Another term important to highlight is that of Objectification Theory, coined by Fredrickson and Roberts (1997), which proposes that girls are conditioned to internalize objectification in a patriarchal society. The main questions asked towards this research were as follows: What effects did the show 13 Reasons Why have on teenage mental health issues? In what ways did 13 Reasons Why fail at building an atmosphere around dialogue for suicide? How does Objectification Theory play a role in 13 Reasons Why and in girls’ mental health? How did 13 Reasons Why fail at establishing dialogue concerning girlhood experiences? This research was approached with a Mixed Method research methodology, primarily using Critical Analysis through viewing and analyzing the first season of 13 Reasons Why, Qualitative Method through Autoethnography, and Literature Review. The outcome from this research was that 13 Reasons Why impacted viewers in how it portrayed girlhood and mental health on screen. Regarding moving forward from this research, it is important to consider the ramifications from this show in future portrayals of teenagers, especially teenage girls, on screen. This research was ultimately created so that future showrunners, producers, and streaming services can take into consideration the effects their show may have on impressionable viewers as well as the importance of accurate and thoughtful on screen portrayals of sensitive issues regarding teenagers and girlhood.

103 9:50 am

A text mining analysis of the Parler social media platform

Timothy Andersen, M.S. in Big Data Analytics (M)

Parler is a social media platform. It has become popular with users that have either left or have been deplatformed from larger sites such as Twitter. Over time, it has become associated with the discussion of false information and the use of violent language. In early 2021, a large dataset of 183 million user posts from the platform were published. This analysis uses several text mining methods to explore the following: (1) What were popular topics discussed on the Parler platform from January 2020 to January 2021? (2) What were the people and places commonly discussed in those topics? (3) What kind of sentiment did discussions about certain topics, people, and places have. The embedded topic model library BERTopic is used to generate a list of topics based on the semantic similarity of user posts. The natural language processing library spaCy is used to detect named entities from user posts. The sentiment analysis model VADER is used to assign sentiment scores to user posts. Initial results suggest that topic modeling is helpful for categorizing Parler content into coherent topics.

104 10:05 am

Crime Reporting and the Formation of Place Identity in Cape Town Communities

Michelle Jeliazkov, Political Science (U)

This study looks into the way media in Cape Town, South Africa portrays Black townships. Even in this post-apartheid era, White South Africans do not usually enter Black communities, so their primary source in learning about these communities is largely the news media. Thus, media portrayal may be a critical factor in the ongoing inequality and stigma that Black communities face, as the messaging of local news sources may impact and interact with existing divisions and segregation within modern-day Cape Town. Specifically, this study examines the way that the dominant English-language print newspaper in Cape Town (The Cape Times) portrays crime and violence in Langa, Cape Town’s oldest Black township. To conduct this research, we gathered all articles and images that refer to the community of Langa during a five year period through an online archive of the Cape Times. All data are taken from the years between June 2016 and May 2021. To facilitate analysis, we logged key content about each relevant article into a spreadsheet and entered each article and photograph into the qualitative analysis program NVivo, which we used to code their main content themes. These codes allow us to discover quantitative patterns across the data set as well as identifying bodies of material for interpretive analysis about the way the Cape Times portrays crime in Langa. Although our analysis is still in process, preliminary results show that the code “Crime and Violence” appears at much higher rates in the data set than any other code. This finding suggests that the Cape Times focuses on crime as a key aspect of its coverage of Langa, a pattern that may contribute to the negative perception of Langa by other Cape Town residents. A detailed literature review of media studies regarding the portrayal of Black townships in South Africa indicated that there is little to no research previously published on this topic. This research therefore provides new insights into popular perceptions of marginalized communities and the responsibilities of news media in its portrayal of these communities.

105 10:20 am

Fast and furious: identifying meaningless data in the Women's Health and Wealth web-based survey

Ijeoma Ogbonnaya, Interdisciplinary Research on Substance Use (D)

Introduction: The pen-and-paper and Internet responders' behaviors have been shown to be similar, but the concerns of obtaining meaningless or fraudulent responses have grown as Internet surveys have become more popular. This study employs a set of statistical and qualitative techniques to analyze responses to a web-based survey.

Methods: We analyzed responses to the Women's Health and Wealth web survey, designed to assess intimate partner violence among young women in Arizona aged 18-24 formerly in foster care. Data were collected from June/2020 to September/2020. The web-based survey was distributed through local child welfare stakeholders and a private Facebook page designed for the study population. Following Leiner(2019) recommendations, we identified meaningless data by calculating post-hoc measures based on: (i) duplicated/similar responses, (ii) confirmatory questions, (iii) percentage of missing data, (iv) deviance from the mean, (v) survey response time, and (vi) qualitative analysis of open-and-close-ended responses.

Results: From the initial sample of 274 responses, 26.6% (n=73) were considered meaningless data. Four participants were excluded for having very similar open and close-ended responses. As the sample should encompass only women from 18-24-year-old, we considered participants reports on marital status as “widowed” potentially fraudulent (37%, n=27). The questionnaire completion rate was very high, with an average percentage of missing data of 2%. The 95% quantile was used as the threshold for deviance from the mean (Mahalanobis distance) and completion time. The Mahalanobis average was 22.17. As the questionnaire length varied according to the skip patterns, we computed completion time as seconds per question, controlling for the number of questions and characters in open-ended questions. Averages times were 12.68 seconds (no open-ended response), 17.65 seconds (one open-ended response), and 14.88 (two open-ended responses). In line with the literature, the completion time was a key statistic to detect meaningless data, responsible for 34% (n=25) of the deletions. Finally, we excluded participants with inappropriate open-ended responses (23%, n=17).

Conclusion: Many exclusion criteria overlapped, ratifying the characterization of meaningless data. Besides the evidence towards completion time being key to detecting meaningless data, the question designed to catch potentially fraudulent data (“marital status”) was an asset to the analysis. The qualitative analysis of open-ended responses corroborated the strategies proposed by Leiner(2019) and aggregated validity to the findings.

Session A-2

Oral Behavioral and Social Sciences 2

Friday, March 4, 2022, 9:00 am

Location: Mata'yuum

106 9:05 am

Systematic Review Process

Rebekah Alvarado, Sociology (U)

We performed the first two stages of a systematic review examining structural drivers of health disparities among sexual and gender minorities and racial minorities. Our goal was to identify the peer review literature (2000-2021) on structural determinants and correlates of (1) tobacco and substance use and (2) mental health disparities and outcomes among LGBTQ+ youth and young adults examined via quantitative empirical research. We searched 6 databases for articles. The articles we searched for included terms related to sexual minority status and health outcomes such as tobacco, substance use, and mental health, including but not limited to depression, anxiety, suicidal ideation or attempts, PTSD. We had 3747 articles once the duplicates were removed.

For Round 1 of the review two students and/or faculty reviewed each title and abstract. We were able to narrow our results down to 966 articles which included those marked “maybe,” “include”, and those in “conflict.” The articles in “conflict” are those in which one reviewer marked the article “include” and another marked it “maybe.” We reviewed all articles in conflict to be sure they were marked correctly as an “include” or an “exclude.” Our exclude rate was 74.2% (2781 articles), include was 0.4% (15 articles), maybe was 21% (788 articles), and those in conflict were 4.4% (163 articles).

After an additional review of the conflicted articles, we ended with 111 articles that moved to the full article level of review. The second level of review has yielded approximately 42 articles for inclusion in the systematic review.

Now that we were down to 111 articles, we moved on to reading the full text of each article in order to assess if the article would remain included in our systematic review. The results have been narrowed down to 48 articles to be included. We still have 19 articles to complete in Round 2.

This topic is important to the fields of Sociology and Public Health because it guides understanding of structural determinants like policies, schools, and neighborhood contexts. Preliminary results on the coding of the final 19 articles will be available for the Student Research Symposium presentation.

107 9:20 am

Prevalence of the School to Prison Pipeline in San Diego

Nicole Mendoza, Sociology, History and Criminal Justice (U)

This research focuses on the school to prison pipeline and how this issue plays into larger themes of mass incarceration. The United States has the largest prison population in the world, with the highest per-capita incarceration rate, juveniles have fallen victim to this phenomena, with it disproportionately negatively affecting individuals of color. Research has shown that this phenomena has been perpetuated by a lack of social structures being implemented in the advantage of children of color, demonstrated by educational segregation. Common practices in schools are to combat violence or deviance with punishment or a three strike system which only works to further perpetuate recidivism rates, and a school to prison pipeline. Because of this, schools have become targets of increased criminalization of young people. Additionally, the use of police officers in a school setting only works to further heighten this as any act of 'deviance' or any violation of school rules can be seen as breaking the law and thus result in possible legal trouble. The use of police officers in a school setting creates a disproportionate power structure, and an unsafe environment for low income children. Due to the presence of school resource officers, education systems do not act in the interest of low income students of color. Moving away from harsh punishments and towards restorative justice would create a better relationship between children and education. Although San Diego has recently adopted practices to help combat this phenomena, its impact still remains the same, and it is imperative that we take strides to shed light on this, and work to change the narrative. This research aims to better understand the historical context of the school to prison pipeline in San Diego by doing a literature review. A literature review will allow for analyzation of sociological themes as well as allow for us to fill in the gaps. Additionally, my primary goal is that through research I will better be able to understand how our segregated system and society have perpetuated inequalities that surround low income students and thus as a result further perpetuate the school to prison pipeline.

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108 9:35 am

Services, Not Sweeps: Community Responses to City-Sanctioned Homeless Encampment Sweeps in Los Angeles, CA

Nicolas Gutierrez III, Criminal Justice and Criminology (M)

The City of Los Angeles is home to over 41,000 individuals experiencing homelessness, forming one of the largest homeless populations in the United States. Nearly 70% of unhoused individuals stay in places not meant for sleeping, such as vehicles, tents, and makeshift shelters (LAHSA, 2020). A recent increase in the unsheltered homeless population across the city has prompted attempts to control their visibility, including a 2021 anti-camping ordinance passed by the LA City Council that bans sitting, sleeping, lying down, and storing property in the public right-of-way throughout the city. City agencies have also ramped up homeless encampment sweeps in which occupants are evicted from their makeshift shelters and given limited opportunity to secure their belongings before they are impounded and/or destroyed. Encampment sweeps have literally become a matter of life and death due to the loss of life-sustaining items like medicine as well as the use of heavy and dangerous machinery like bulldozers. Some community members—housed and unhoused—have deemed the city's current encampment management practices inhumane and taken it upon themselves to resist the harmful effects of sweeps through sweep blockades, community cleanups, and other forms of mutual aid.

The purpose of this study is to explore the lived experiences of encampment residents and homeless advocates with city-sanctioned sweeps and community-organized responses. I will conduct structured interviews with approximately 30 adults who self-identify as currently living in a homeless encampment, having lived in an encampment in the past, and/or engaging in homeless advocacy in Los Angeles. The interviews will focus on participants' current living and housing circumstances; interactions with outreach workers and law enforcement; experiences during sweeps and community responses; and organizing activities like the coordination of mutual aid actions. The interview findings will inform recommendations to improve current homeless encampment management and service provision practices by Los Angeles and similar cities, with the aim of promoting humane and equitable responses that can enhance the quality of life for the unhoused.

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109 9:50 am

The Research to Practice Gap: Exploring the attitudes toward evidence-based practices in substance use providers

Melanie Nicholls, IRSU (D)

Background: The research to practice gap in general health care practice is the result of factors such as limited time and resources, lack of training for EBPs, lack of incentives for using EBPs, inadequate infrastructure at the organizational level, and providers seeing their clinical experience as being more useful than EBPs, which will be referred to as divergence. Limited research has been done to explore the profound research to practice gap in the substance use field and why the implementation of EBPs continues to lag on.

Methods: From October 2021-January 2022, 87 providers in California who work with people who have a substance use disorder participated in an anonymous online survey through Qualtrics. Participants were gained through convenience sampling and online platforms, such as Facebook groups and subreddits.

Results: Participants were on average White (62%), 30-39 years old (43.7%), 48.3% identified as women and 48.3% identified as men. 34.5% of participants had a master's degree, 29% had a bachelors, and 9% had a doctorate degree, such as MD or PhD. Participants have been working in the substance use field ranging from less than a year to over 17 years. Multilinear regressions were used to assess the relationship between knowledge of EBPs and positive attitudes toward EBPs. Providers who had more knowledge of EBPs had more positive attitudes toward EBPs (F(1,68)=24.8, p<.001). Multilinear regressions were used to assess the relationship between perceived limitations of EBPs and divergence. Providers who perceived more limitations to EBPs scored higher in divergence (F(1,78)=36.2, p<.001).

Conclusion: The substance use field continues to fall behind when it comes to EBPs and their implementation. This study looks at some of the barriers and facilitators of EBP use when it comes to providers who work in the substance use field, such as knowledge of EBPs, attitude towards EBPs, and divergence, which is when providers perceive their experience as more useful than EBPs. This research can help identify if substance use providers need more knowledge or to increase their attitudes toward EBPs to increase the use of them in substance use treatment setting.

110 10:05 am

Open Drug Scenes: a call for environmental interventions

Alexandra Almeida, Interdisciplinary Research on Substance Use (D)

Introduction: In Brazil, about 80% of People Who Use Crack (PWUC) consume drugs in Open Drug Scenes (ODS), public spaces with social meanings where people socialize with peers, buy, sell, and use drugs. In these settings, PWUC are subject to environmental/contextual risks ranging from harmful hygiene conditions to illicit activities and drug cartel practices. Previous studies have found that environmental influences are critical determinants of poor health outcomes associated with crack use, HIV, and HCV. This study aims to understand the ODS and unveil the main characteristics of these settings.

Methods: I analyzed the Brazilian open drug scenes' field notes elaborated by the Brazilian Crack Survey. This study encompasses ethnographic descriptions of 2,500 ODS, mapped in the first semester of 2011, from all Brazilian states. I used Natural Language Processing methods to quantitatively extract information from the ODS textual descriptions. Structural Topic Modelling (STM), a computer-assisted text classification technique using an unsupervised machine-learning approach was used to extract the main topics/themes characterizing the ODS.

Results: Daylight ODS were described as depredated spaces with homeless and children. The evening ODS were characterized by the presence of youth using alcohol, with bars nearby. The STM result pointed to a 10-topic solution. The "disco club" topic emerged from scenes located close to disco clubs with young PWUC, many times also consuming alcohol. The "dirty" topic emerged from ODS described as places lacking hygiene, with a lot of trash in the streets. Topics associated with the visibility of the scenes also emerged from the analysis: whereas "Ghetto" topic described more hidden spaces, far from outsiders seen, the "Viaduct" theme described spaces close to busy streets. The "Paraphernalia sharing" was an important theme that emerged, with the potential to be used in future studies associating the ODS with infectious diseases (as HIV and HCV) among people who use crack.

Conclusion: The understanding of ODS is crucial to any crack-cocaine-related research in Brazil. Besides the social context the ODS entitle, their potential to foster infection diseases and sustain vulnerabilities is important. By unveiling the PWUC contextual risk factors, this study may inform future environmental interventions focusing on crack use, HIV, and HCV transmission and treatment.

111 10:20 am

Investigating if neurocognitive abilities post drinking initiation in late adolescence can predict changes in later alcohol use

Nafisa Ferdous, Interdisciplinary Research on Substance Use (D)

Background: Research has focused on investigating the influence of alcohol use as a predictor

of later neurocognitive deficits, but few studies have investigated whether neurocognitive

abilities post-drinking initiation predict changes in alcohol use later on. Our aim was to

investigate if neurocognitive task performance during maximum alcohol use in late adolescence

(time point 1- T1) predicts changes in drinking pattern 3-6 years later (time point 2- T2).

Methods: Analyses (n=105) were conducted on a longitudinal dataset involving adolescents

(12-13 years-old at baseline) who were followed for 16 years. Time 1 (T1) was defined as the

individuals' maximum drinking year within the first 10 years and Time 2 (T2) was the first

available alcohol use data entry 3-6 years after T1. Four hierarchical linear regression models

predicting change in follow-up alcohol use (T2-T1) were estimated: drinking occasions, average

drinks per drinking days, peak drinks, and binge episodes. Step one of each model included the

covariates- age at T1, follow-up duration (T2-T1), and sex. Step two included the main effects of

four neurocognitive domains (inhibition/flexibility, visuospatial ability, verbal memory, and

working memory) and step three included the interactions between sex and neurocognitive

scores.

Results: Visuospatial ability (WAIS Block Design; ß= -.30, p=.005, CI: -15.05-[-2.66]),

working memory (WAIS Digit Span; ß= -.25, p=.015, CI: -10.4-[-1.12]), and verbal memory

(CVLT Long Delay Free Recall; ß= .31, p=.004, CI: 6.31-32.1) were found to predict changes in

binge episodes, while inhibition/flexibility (D-KEFS Color-Word Interference Inhibition

Switching) predicted changes in drinks per drinking day (ß= .24, p= .018, CI: .052-.563), and

peak drinks (ß= .21, p= .045, CI: .009-.854). Verbal memory also predicted changes in drink

days (ß= .22, p=.040) and interacted with sex to predict changes in peak drinks (ß= .32, p=.027)

over the two time points.

Conclusion: Our findings suggest that these neurocognitive abilities during the period of

maximum drinking in late adolescence predict changes in later alcohol use behaviors and could

potentially inform intervention research targeting this age group.

Session A-3

Oral Behavioral and Social Sciences 3
Friday, March 4, 2022, 9:00 am
Location: Aztlan

112 9:05 am

Investigating How Prenatal THC, Nicotine, and Combination of Both Affects Sensorimotor Maturation in Rats

Samantha Tasman, Psychology (U)

Previous studies have shown that prenatal exposure to drugs of abuse, such as alcohol or nicotine, can lead to both neuropathology and behavioral deficits. However, there is limited information about the effects of prenatal delta-9-tetrahydrocannabinol (THC) exposure on fetal development. As THC and nicotine are the most commonly used illicit and licit drugs used among pregnant women, it is important to understand how THC and nicotine, both individually and in combination, impact brain and behavioral development. In this study, pregnant rats were exposed to THC, nicotine, the combination, or vehicle via an e-cigarette model from gestational days 5-20 in a 2 (0, 36 mg/ml nicotine) x 3 (0, 100, 200 mg/ml THC) design. A non-vapor control was also included. After birth, one sex pair (male and female) from each litter was randomly selected for testing. To examine sensorimotor maturation of the offspring, grip strength and hindlimb coordination was measured from postnatal day (PD) 11-14. The forepaws of each subject were placed on a rod and the ability to hang and/or place the hindlimb on the rod was measured for two consecutive trials (30 secs each) each day. Preliminary results indicate that prenatal exposure to 200 mg/ml THC impairs motor performance, reducing the duration of rod hanging and overall successes. Prenatal nicotine exposure did not significantly reduce the number of subjects that reached success criteria, but reduced the duration of rod hanging on the first days of testing. Interestingly, data suggest that exposure to the 200 mg/ml THC group, and in particular, the combination group of nicotine and high THC, delayed and/or impaired performance. In contrast, the combination of prenatal nicotine and 100 mg/ml THC dose may advance motor hindlimb coordination development. These data indicate dose-dependent effects of THC and the combination of nicotine and THC induce some unique effects. Importantly, perturbations in the normal progression of motor development can have long-lasting deleterious effects on later behavior. These findings illustrate that vaping THC can be harmful to the fetus and have important implications for public health policies related to cannabis use among pregnant women. Supported by TRDRP 28IP-0026.

113 9:20 am

Effect of Prenatal Exposure to THC, Nicotine, and Combination of Both on Early Motor Development in Rats

Alia Westphal, Psychology (U)

Cannabis and tobacco are two of the most used substances during pregnancy. In fact, concurrent use has increased with the popularity of electronic cigarettes, which are viewed as less harmful than combustible products. Prenatal exposure to nicotine, the active constituent of tobacco, has been shown to adversely affect the developing brain, but the consequences of prenatal exposure to delta-9 tetrahydrocannabinol (THC), the psychoactive constituent of cannabis, are not well understood. In addition, the concentration of THC in cannabis has consistently risen over the past few years, though little research has established possible effects of high THC concentrations on fetal development. Moreover, research is needed to assess the effects of concurrent prenatal THC and nicotine exposure, as these drugs are easily combined in e-cigarettes. Thus, the present study examined the effects of prenatal THC, nicotine, and the combination of both on motor development using different concentrations of THC. Pregnant Sprague-Dawley rats were exposed to either nicotine (36 mg/ml), low THC (100 mg/ml), high THC (200 mg/ml), nicotine and low THC, nicotine and high THC, or propylene glycol via vapor inhalation from gestational days 5-20. On postnatal days 2-12, male and female offspring were tested on four motor development tasks including geotaxis, righting, grasping and cliff avoidance. Prenatal exposure to nicotine, THC, or the combination altered overall motor development compared to both control groups. There was a dose-dependent effect of THC exposure, regardless of the presence of nicotine, with subjects exposed to high THC showing advances in the forelimb grasping reflex. In contrast, subjects exposed to low THC, alone or in combination, showed delays in motor development on the same task. Subjects exposed to nicotine alone showed advances in geotaxis and righting, but delays in hindlimb grasping. Overall, these data show that prenatal THC and nicotine exposure can influence early motor development. Interestingly, the effects of THC on early motor development are dose-dependent, with the low and high dose having opposite effects on motor development compared to controls. These data indicate that prenatal exposure to e-cigarettes with either nicotine or THC can lead to disruptions in behavioral development. Supported by TRDRP 28IP-0026.

114 9:35 am

Choline Supplementation Mitigates Effects of Prenatal THC Exposure on Spatial Memory in Rats

Karen Thomas, Psychology (M)

Cannabis and tobacco are among the most commonly used drugs in pregnant women. Unfortunately, prenatal exposure to either or both drugs may place the fetus at a higher risk of developing cognitive impairments. Further, with the use of electronic cigarettes (e-cigarettes) becoming increasingly popular, the ability to consume nicotine and cannabis has become much more accessible. Although there is no known treatment for effects of prenatal drug exposure, recent clinical evidence suggests that higher maternal choline levels are associated with reduced risk to adverse effects of marijuana on the developing fetus. Thus, the present study investigated the ability of early choline supplementation to mitigate the effects of prenatal exposure to nicotine, THC, and the combination of both on spatial learning and memory. Pregnant Sprague-Dawley dams were placed in a vapor inhalation chamber from gestational days (GD) 5-20. Subjects were exposed to either THC (100 mg/mL), nicotine (36 mg/mL), the combination of both, or propylene glycol (vapor vehicle control), via e-cigarette (6 sec puff every 5 min for 30 minutes per day). From postnatal days (PD) 10-30, male and female offspring received subcutaneous injections of either choline chloride solution (100mg/kg) or saline. Subjects were tested on a Morris Water Maze spatial learning and memory task from PD 40-46, in which subjects had to locate an escape platform in a pool of water using visual spatial cues. Prenatal nicotine did not impair spatial learning or memory. In contrast, prenatal exposure to THC impaired spatial memory most robustly in females, with the most severe deficits in subjects exposed to both THC and nicotine. However, THC-exposed females who received choline showed greater spatial accuracy, and spent more time in the target area, indicating improved memory. THC-exposed females who received choline also showed less anxiety behavior, based on reduced thigmotaxis. These findings suggest that choline mitigates some of the cognitive deficits caused by prenatal THC and, particularly, the combination of THC and nicotine; choline may modify emotional behavior, as well. Importantly, these preliminary data suggest that choline administered postnatally may reduce the severity of prenatal exposure to cannabis. Supported by TRDRP 28IP-0026 and 5R37AA012446-17.

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115 9:50 am

Childhood Adversities and Social Support Experienced by Latinx Young Adults: A Qualitative Study

Sarah Chavez, Interdisciplinary Research on Substance Use (D)

Most Latinx-focused adverse childhood experience (ACE) studies have utilized a standard measure, that does not include childhood adversities such as familial deportations, discrimination, and poverty which are often experienced by Latinx individuals. This study aimed to explore what other childhood adversities have been experienced, among Latinx young adults, that have not been captured in the ACE questionnaire.

This qualitative study used preliminary results from interviews with 20 Latinx young adults, ages 19-24, residing in California. We created a semi-structured interview guide, in English, that was refined to ensure that the interview guide was trauma informed. We recruited participants through Instagram. Sociodemographic information was collected during the 45–60-minute interview. Participants answered, retrospectively, on questions regarding experienced childhood adversities, emotions experienced during their adversities, and obtained and/or desired social support.

Over half, 11, of the interviewees identified as female while 9 identified as male. Interviewees were about 22 years old. About 80% of the interviewees experienced financial insecurity, 65% experienced housing instability, and 55% faced discrimination before the age of 18. Approximately 25% of interviewees reported that the 2008 housing crash was responsible for their housing instability. About 40% witnessed a family member deported. Some interviewees did not talk to anyone, as their adversity was occurring, due to fears of getting their parents into legal trouble (15%), possibly getting taken away from Child Protective Services (25%), or stigma-related reasons (15%). Approximately 60% of interviewees stated that they needed emotional support; 35% needed some form of informational support at the time of their adversity. A total of 35% of the interviewees reported they would have wanted group therapy while 30% reported wanting individual therapy at the time of their adversity to help them process their experiences.

Our results show the need to develop a culturally tailored childhood adversity measure that considers the adversities faced by Latinx children and youth. Additionally, these results are a call to action to mental health providers, with expertise in childhood adversity and who are culturally competent, to address the multifaceted experiences of some Latinx children and youth. This work was supported by funding from NIAAA (T32 AA013525).

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116 10:05 am

Intergenerational trauma and substance use: A qualitative study exploring substance use within the East Africa community in San Diego, California

Dania Abu Baker, Interdisciplinary Research on Substance Use Joint Doctoral Program (D)

Background: Historical community trauma is the cumulative emotional and psychological wounding experienced across generations as a result of major group trauma. One example of a community who experienced historical community trauma is the East African community. San Diego is home to the second largest East African community in the United States and second largest immigrant/refugee community, estimated at 75,680 people; 30% of whom are East African from Somalia, South Sudan, Ethiopia, Eritrea, Uganda, and Kenya. Currently, this community is facing a substance use and mental health crisis. More specifically, at least 20 deaths due to suicide or overdose from opioid, alcohol, or methamphetamines have occurred over a two-year period in this East African community. Yet, we know little about the role of historical community trauma on mental health of this community. This study aimed to explore the role of historical community trauma on substance use within the East African community in San Diego. Methods: We employed the Rhodes' Risk Environmental Framework to examine trauma multidimensionally: at individual, intergenerational, and structural levels. Semi-structured interviews were conducted with 60 participants in their preferred language (e.g., Somali) from the East African community in San Diego. Interviews were translated to English and transcribed. Thematic analysis was used to analyze data (Nvivo 12). Results: Prominent themes among older generation included exposure to direct war traumas while younger participants mentioned trauma related to worrying about family members in country of origin, or through news outlets. Themes related to structural level trauma included discrimination and racism experienced in educational and health settings. Importantly, substance use was perceived as a form of coping with past traumas and assimilating in current culture. While the youth relied more on substance use to cope with trauma, the older generation utilized social support and spirituality. Conclusion: intergenerational trauma was evident in the East African community and had different impacts on older generation and youth. Study findings can inform the development of age-relevant and trauma informed interventions for this community.

Session A-4

Oral Biological and Agricultural Sciences 1
Friday, March 4, 2022, 9:00 am
Location: Metzli

117 9:05 am

The transcriptional control of CG11617 in Muscle Development

Elizabeth Trujillo, Cell and Molecular Biology (D)

The mammalian Mohawk transcription factor is known to be expressed in embryonic precursors of skeletal muscle and functions by regulating the transcription of slow-twitch myosin-heavy-chain isoform expression in fast-twitch muscle fibers, through Sox6 repression, during muscle development. However, we do not fully understand its mechanistic role in invertebrate skeletal muscle development. By using the Drosophila melanogaster Mohawk ortholog, termed CG11617, we first analyzed CG11617 localization. Thoracic flight muscles reveal nuclear CG11617 localization whereas the tergal depressor of the trochanter muscles (TDT, or jump muscles) reveal nuclear and cytoplasmic localization between the myofibrils. Analysis of CG11617, knockdown animals revealed that these flies are lethal in the pharate adult stage. Upon examination, these mutant flies showed fibrillar disorganization of indirect flight muscles, the absence of jump muscles, and a significant decrease in imaginal wing disc myoblasts compared to the wild-type. Together, these findings may account for the overall skeletal muscle impairment and pupal lethality observed in the knockdowns. Furthermore, utilizing Gal4 driver lines containing fiber-specific enhancer-lacZ constructs, to follow muscle fiber fate, we observed a fibrillar muscle to tubular muscle identity switch in these mutant flies. Overall, these findings suggest that CG11617 may skew skeletal muscle precursor differentiation towards one fiber-type versus another, and CG11617 is a determinant of skeletal muscle fiber-type specification and differentiation.

118 9:20 am

Aging-Related Post Translational Modifications Of Myosin Influence Sarcopenia And May Be Ameliorated By Foxo Expression

Clara Neal, Molecular Biology (M)

Aging is associated with decline in skeletal muscle strength (sarcopenia) that can lead to injury, disability, and inability to exercise. The molecular motor myosin is critical to muscle function, as it forms cross-bridges with actin-containing thin filaments and hydrolyzes ATP to contract muscle fibers. Myosin is comprised of: 1) rod-like alpha-helical tails that coil together to form dimers, which assemble into thick filaments; 2) globular heads with ATP and actin binding sites and 3) a lever arm that is important for force generation.

Myosin's biochemical properties are hypothesized to be affected by age-related post-translational modifications (PTMs), which could disrupt muscle structure and function. Three mimics of human myosin heavy chain PTMs in skeletal muscle were used to assess their involvement in muscle deterioration in the insect Drosophila. N1168D is in the rod and mimics deamidation of asparagine, N81T is in the globular head and mimics hydroxylation of asparagine and R908E lies in the lever arm and mimics carbonylation of arginine. Muscle function was evaluated through jump testing, with PTMs found to compromise jump ability throughout aging in all mutant lines (as was previously found for flight muscles). In terms of myosin function, gel electrophoresis demonstrated reduced myosin filament formation in N1168D, but this was unchanged in R908E. Further, myosin ATPase activity was entirely diminished in N81T, while R908E remained similar to the control. Therefore, PTMs N1168D in the rod and N81T in the head disrupt myosin, and consequently muscle, structure and function.

We are testing the hypothesis that overexpression of the FOXO proteostasis regulator would improve muscle structure and function by removing damaged myosins in post-translational mimic heterozygotes experiencing sarcopenia. We used the flightin transcriptional driver to induce expression of FOXO in flight muscle, which we are substantiating through qPCR. Preliminary results show some improvements in muscle function using the flight testing assay.

This combination of data demonstrates how PTM alterations of myosin worsen muscle structure and function during aging and yield insights into methods to ameliorate deterioration, such as FOXO overexpression. If successful in Drosophila, there is promise that these mechanisms and treatments will translate into humans.

119 9:35 am

Neural signature of executive dysfunction associated with long COVID: A multimodal brain imaging approach

David White, Psychology (M)

The coronavirus disease (COVID-19) global pandemic has been associated with high mortality and far-reaching socio-economic disruptions, and has exerted devastating impact on mental and physical health. A sizeable subset of people who recover from the acute infection continue experiencing health problems that commonly include cognitive dysfunction ("brain fog"), chronic fatigue, insomnia, and headaches. Despite the prevalence of long COVID syndrome, the evidence on its neural underpinnings is lacking. To examine the multifaceted nature of cognitive alterations associated with long COVID, this project has used a multimodal imaging approach. It combines complementary advantages of electroencephalography (EEG) and functional

MRI (fMRI) during tasks probing executive functions.

Fourteen individuals with long COVID (L-COVID) participated in EEG (N=12) and fMRI (N=13) sessions and were compared to a demographically matched group of control participants (CONT) whose data were collected with identical tasks prior to the pandemic (20 EEG, 20 fMRI). During fMRI scans, participants performed a modified Stroop word-color task that included trials eliciting low- vs high cognitive conflict. EEG signals were recorded as participants completed a Go/NoGo task probing inhibitory control. Both tasks engage cognitive control as participants must withhold dominant behavioral responses in favor of contextually relevant task-goals. Voxel-wise and region-of-interest analysis of fMRI data were carried out with AFNI (Analysis of Functional Neuroimages). EEG data were analyzed in time frequency domain for event-related power in theta (4-7Hz) and beta (15-25Hz) frequency bands.

The L-COVID and CONT groups did not differ in measures of task performance or general cognitive ability. However, relative to controls, the L-COVID group showed reduced activation of the medial and lateral prefrontal cortices in response to Stroop incongruity, implying deficiencies in cognitive control. L-COVID participants also exhibited lower task-related theta during NoGo trials, indicating less efficient inhibitory control. Additionally, task-related beta desynchronization was delayed, suggesting dysregulated motor preparation.

Taken together, these preliminary findings provide evidence of neural dysregulation during performance of challenging cognitive tasks. In the absence of behavioral impairments, these neural indices are suggestive of dysexecutive symptoms, and could provide a mechanistic biomarker signature of the core neurocognitive dysfunctions characterizing long COVID.

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120 9:50 am

Cerebrovascular modeling of Cockayne Syndrome B using iPSC-derived cerebral organoids and vascular cells

Aaliyah Staples-West, Interdisciplinary Studies: Chemistry, Biology, Africana Studies, language in Spanish (U)

Cockayne Syndrome B (CSB) is an autosomal recessive disorder characterized by neuronal loss, premature aging, hypomyelination and failure to thrive. The CSB gene provides instruction for repairing the damaged DNA pathway. The Cockayne Syndrome B gene, also known as ERCC6, becomes abnormal when mutations arise in the body. The diseased cells are therefore not receiving adequate repairs and leading to cell malfunction and cell death. Modeling the neurological symptoms is extremely difficult, therefore the ERCC6 gene is highly conserved among species. Mouse models aren't a good representation of mirroring the symptoms, therefore CSB patient-derived induced pluripotent stem cells (iPSCs) will be most effective. Our goal is to study vascular defects in CSB using iPSCs to generate and characterize vascularized brain organoids. These CSB iPSCs will be differentiated into vascular endothelial cells(vECs). There are a series of assays known as tube formation, angiogenic bead assay and permeability assay that are all used to study the functional defects of the vECs. These vECs will then be implemented to vascularize brain organoids in a unique microfluidics system that provides hemodynamic forces to the tissue engineered vessels. The microfluidic device is used to show the effects of shear stress and permeability on the vECs. This microfluidic system is composed of the microfluidic chamber, sacrificial scaffold and a multielectrode array to understand the electrophysiological components of the vascularized organoids that are implemented. Modeling the neurological components of this disease are not certain so genetic engineering practices are going to be used to learn more about the poor synchronicity of the iPSC-derived neurons. Our research will assist the path for developmental therapies for Cockayne Syndrome B disorder and test effects at the cellular level.

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121 10:05 am

3D Retinal Organoids with Pax2 Optic Stalk Reporter

Matthew Patterson, Biology with an emphasis in Molecular and Cellular (U)

Human induced pluripotent stem cells (hiPSC) can be forced to aggregate into 3D organoid bodies. In my project, we differentiated 3D retinal organoids from hiPSCs using a specific protocol designed by the Wahlin laboratory at UCSD. We introduced a genetic modification in stem cells so that they are a SIX6-GFP/PAX2-mCherry dual reporter line. This means that when SIX6 is expressed Green Fluorescent Protein (GFP) is synthesized and when PAX2 is expressed mCherry will be synthesized. SIX6 is an early marker of retinal progenitors, as well as forebrain, development, while PAX2 is responsible for optic stalk development. Hence, cells expressing mCherry are part of the optic stalk. Currently, there is very little understanding of the optic stalk development. Therefore, we hope to better understand the microenvironment needed for the development of the optic stalk. We plan on performing single cell sequencing analysis of the optic stalk cells to gain a better understanding of gene expression during optic stalk development.

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122 10:20 am

Direct Conversion of Somatic Fibroblasts into Glial Cells

Ryan Goodman, Chemistry-Emphasis in Biochemistry (U)

Alzheimer’s disease (AD) is the most common type of dementia, accounting for 6.2 million cases worldwide. It is projected that by 2050, this number will double. The greatest known risk factor is advanced age, with the vast majority of those diagnosed being over the age of 65 years old. In the field of neuroscience, neuronal cells have been the main focus of understanding neurodegenerative diseases, such as AD. However, about half of the cells in the brain are glial cells, 20-40% of glial cells being astrocytes and 10-15% being microglia. Increasing evidence suggests that Alzheimer's disease pathogenesis is not restricted to the neuronal compartment but strongly interacts with other components of the brain such as microglia and astrocytes. This suggests we should explore the non-neuronal compartment of the brain.

Alzehimer's Disease is an age-related disease. Further understanding of it requires extensive modeling. Although induced pluripotent stem cells (iPSCs) provide a platform for the modeling of disease, these cells often reflect an embryonic state, and are not mature enough to successfully model age-related disorders, such as Alzheimer's. Additionally, technical challenges remain in terms of differentiation efficiency and yields. To overcome these technical issues, our lab and others have applied direct conversion strategies that either bypass normal development to increase yield or bypass the stem cell state to model features of age. However, these approaches are in their infancy and the number of cell types we can trans-differentiate are few.

So my goal is to create a routine protocol for directly converting somatic fibroblasts to astrocytes and microglia that carry as much of the age-related nature of the cell-type as possible. Essentially, I want to create a model for alzheimers, focusing on astrocytes and their contribution to the disease. To do this, I am going to use CRISPR activation using the SAM complex (synergistic activation mediator).

Session A-5

Oral Humanities, History, Literature, Philosophy 1

Friday, March 4, 2022, 9:00 am

Location: Templo Mayor

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123 9:05 am

The Strategic Masculinities of Nathan Harrison

Jamie Bastide, Anthropology (M)

Universalizing definitions of gender have dominated archaeology in the past. As gender identities evolve, both in society and in archaeology, masculinity is often left in a stereotypical role. Using the oral narratives and historical assemblage of Nathan Harrison's cabin, patio, and midden, this presentation will look at how Harrison performed his own masculinity in Southern California. After being brought to California during the gold rush as an enslaved man, Harrison migrated to San Diego County, witnessing many examples of institutional racism and support for secessionist states. To combat this oppressive system, Harrison created strong social identities to maintain a clear divide between his public and private personas. Outside visitors were only allowed to see Harrison as subservient and harmless. His close friends and neighbors, like the local Luiseno, were allowed to see behind this rouse as Harrison strategically implemented his own version of hegemonic masculinity.

124 9:20 am

Excavating a Community: Recreating and Examining the Demographics of the San Diego State University Imperial Valley Campus Neighborhood in Calexico, CA 1940

Valeria Villafuerte, Social Science (U)

Established in 1959, SDSU Imperial Valley (SDSU IV) campus was originally meant to train and accredit teachers amid a shortage. However, 63 years later, the campus offers a wide variety of programs and credentials beyond teaching. Yet, we know very little about the community this campus has historically served. Just like Imperial County, the history of the SDSU IV campus remains underexplored in academic research. To fill this gap in the literature, and using Ancestry.com to access the 1940 U.S. Federal Census Population Schedules, I recreated three residential blocks surrounding the SDSU IV campus in Calexico, California to understand the social and economic community history. A total of 22 homes and 79 individuals were examined for this archival historical research. My findings reveal drastic changes in socioeconomic status, migration trends, and social shifts of families living in Calexico, California during the 1940s.

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125 9:35 am

An archival exploration of San Diego State University - Imperial Valley Growth

Carlos Fitch, History and Spanish Double major (U)

San Diego State University - Imperial Valley, first established in 1959 in temporary terms per the State Legislature orders to fulfill the ongoing demand of teachers' shortage, evolved into a satellite campus of SDSU. This study explores the growth of this campus during the early years of 1959 - 2019 by analyzing archival sources such as SDSU IV bulletins and institutional reports. Campus' yearly bulletins published since its inception provide a clear insight on the curricular courses offered, the size of tenure track faculty, and the type of student services it offered throughout the years. Although the satellite campus physical growth is evident from its initial location in El Centro, California as a Center to an actual satellite campus in Calexico, California, preliminary findings indicate the slow pace of curricular and programatic growth. Future directions of this research leads us to further explore the historical reasons behind the slow growth of this campus.

126 9:50 am

Undoing Revolution: Race and Gay Activism in San Diego, 1969-1979

Joseph Schaeffer, History (U)

In the post-war period, rising Cold War anxieties surrounding sex and gender exacerbated the oppression of gay men and lesbians in the United States. Homophobic attitudes and government policies were met with organized resistance in large urban centers like Washington D.C., Chicago, and New York, peaking in 1969 at the Stonewall Uprising. As Gay Liberation Front chapters began meeting across America, gay people in smaller cities like San Diego took part in radically intersectional activism against homophobia, racism, sexism, and the Vietnam War. However, by the mid-1970s, American activism lost much of its radicalism, and the so-called anti-war coalition disunified in its intersectional aims. Gay Liberation Front literature, documents, and letters produced by gay activists, photographs, and interviews have allowed previous historians to paint a vivid picture of San Diego's early gay rights movement. When subjected to critical analysis, these texts, documents, and oral histories also reveal important details regarding the attitudes held by San Diego activists about race, gender, and sexuality. My research concludes that while the gay rights movement in San Diego was mostly in line with the national shift from anti-war era intersectionality to narrowly focused single-issue activism, gay and lesbian community members fought to create space for women and people of color. Activists in the 1970s laid the groundwork for future intersectional groups like Lesbians and Gays of African Descent United and Las Hermanas. Although San Diego Gay Liberation Front was short-lived and its revolutionary vision was never realized, its members profoundly impacted anti-racism in the LGBT community.

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127 10:05 am

A Native American Perspective on Sustainable and Resilient Infrastructure in Southern California

Fatima Shahine, Environmental Engineering (U)

Although the needs for sustainable urban infrastructure systems are increasingly being recognized and addressed, the same is not true for Native American communities, where existence, condition, and access to a collection of infrastructure systems is often lagging behind urban and non-native communities. Drawing from six focus group discussions and three tribal reservation visits, our study highlights challenges and opportunities for building sustainable and resilient infrastructure systems on tribal reservations in San Diego County, California, from the perspectives offered by Native Americans themselves. We focus on infrastructure systems fundamental to well-being: built environment, water/wastewater, telecommunications, transportation, energy, and human capital. Our research participants emphasized the importance of their cultures, sovereignty, and care for the welfare of their communities in innovating sustainable and resilient infrastructure. To accomplish this, a key priority should be to train native engineers, who are best positioned to understand the infrastructure needs and opportunities in their own communities.

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128 10:20 am

Nuclear Power and Environmental Justice: A sociodemographic case study of decommissioned California power plants

Jordan Alcarez, City Planning (M)

Rural to urban migration and rapidly expanding city populations have resulted in the expansion of many urban communities, increasing population density, and putting more pressure on local land uses. Land use is determined via zoning and has tremendous environmental, social, and economic implications. To meet the need for residential land uses, an increasing amount of land is being developed for housing and other community needs. Additionally, with swelling populations, there is an increased need for electricity. One way we have met these energy needs is through the use of nuclear power, a controversial energy source due to public health concerns. While nuclear energy is a great way to intensively produce energy, this process creates nuclear waste– a permanent environmental hazard. The lack of permanent nuclear waste storage presents unprecedented health and environmental implications for communities across the globe (Pearse, 2012). For urban planners, it is important to examine the racial and socioeconomic demographics of communities, to ensure that all residents are provided with equal environmental and public health – environmental justice (Bullard 1996). In this context, this project investigates the environmental justice implications associated with three nuclear power plants in California and is aimed at understanding the risks to communities of concern living near these sites.

In California, there are three now inactive sites, located in San Clemente, Sunol, and Eureka. While the housing crisis and implications of exposure to nuclear waste have been thoroughly examined, there is a lack of research that focuses on the intersections of city planning, environmental justice, and nuclear waste. This study is aimed at determining the racial and socioeconomic characteristics of the communities within three buffer zones around California's nuclear sites, and to compare these areas to surrounding neighborhoods. The purpose is to determine what populations may be most vulnerable to health and environmental implications resulting from a lack of a permanent storage site and to provide recommendations for planners working in these locations.

Session A-6

Oral Engineering and Computer Science 1

Friday, March 4, 2022, 9:00 am

Location: Visionary Suite

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129 9:05 am

Detection, Quantification, and Simplified Wastewater Surveillance Model of SARS-CoV-2 in the Tijuana River

Alma Rocha, Civil Engineering (Environmental Engineering) (M)

The COVID-19 pandemic and the detection of SARS-CoV-2 in untreated wastewater has resulted in a resurgence of global interest in wastewater monitoring and surveillance. In many parts of the world where sewer collection systems and wastewater treatment systems are failing or lacking, untreated wastewater is transported via channels, streams, and other (often open) conveyance systems and mixes with surface waters. Also, some settings have combined sanitary and storm sewer systems (CSSs), where untreated wastewater may mix with stormwater. Therefore, there is a need to develop better methods for the surveillance of pathogens such as SARS-CoV-2 in unsewered communities.

The Tijuana River, which flows northwest from Baja California, Mexico to San Diego County, CA, USA was sampled during dry weather conditions and following rain events between July 2020 and May 2021. Samples were collected at two sites, one located close to the US-Mexico border and the other near the ocean outfall. These samples were analyzed for

SARS-CoV-2 (N1 and N2), Enterococcus, E. coli, and pepper mild mottle virus (PMMoV). SARS-CoV-2 was detected in the upstream location on six out of eight occasions, two of which were at concentrations as high as what was detected in untreated wastewater from San Diego County. The virus was not, however, detected in any of the eight samples collected at the downstream sampling location, despite the consistent detection of PMMoV at high concentrations at that location. The total travel time of wastewater delivered to the International Boundary of Tijuana River was estimated at 10 hours in dry weather. Synchrony was observed between the number of cases reported in Tijuana and the SARS-CoV-2 concentrations, when the latter were normalized by the reported flow rates in the river.

The microbial data recorded describes the severity of pollution in the Tijuana River; however, the methodology used can be applied to the hundreds of CSSs existing in the United States, as well as thousands of communities throughout the world that have lower rates of improved sanitation. By relating concentrations of human pathogens detected in bodies of water to more easily accessible data such as flow rate and clinical infection rates, environmental waters can be used to monitor such diseases.

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130 9:20 am

Novel Microfluidics Platform for Detection of COVID-19 Virus

Xavier Leasau, 4+1 BS/MS Mechanical Engineering / Bioengineering (U)

Background:

Severe acute respiratory syndrome coronavirus-2 (SARS-CoV-2) or commonly known as COVID-19 has been prevalent since its original appearance in December of 2019. To date (01/20/2022), there are over 340 million cases worldwide, making it one of today's leading infectious diseases. The quickest way to test for the virus is the rapid antigen test, that can be purchased over the counter. They use a nasal swab to collect samples from the patient which are then mixed with a buffer solution and after a few minutes color changing dye is activated when in presence of the virus. This form of testing however produces results that often need to be confirmed with secondary testing. Utilizing emerging technologies such as 3D printing, microfluidics, and micro electromagnetic systems we can create novel modes of detecting the virus. These modes are able to improve the accuracy of these tests to help with faster and precise diagnostics for a world in need.

Methods:

Microfluidic devices use capillary forces to drive the sample into a mixing chamber and into the diagnostic dye in an accurate and rapid way. Improving upon the existing technologies of rapid testing to use multiple vias to increase the amount of tests done, overall accuracy of the tests can be improved. Excretion of the cotton swab containing the patient sample and buffer solution is also a critical step in the diagnostic process, using additive manufacturing we are able to consistently extract a larger amount than the current "rolling" method. This process is also easy to use and decreases the amount of cross-contamination.

Discussion:

Knowing that resources are limited due to the impact of COVID-19 we aim to improve production volume by using more accessible materials. Recyclable materials can reduce manufacturing cost to increase the accessibility of tests for patients. We are able to improve the accuracy of the rapid antigen covid-19 tests by providing multiple results to show a more accurate average, creating a closed system where we reduce the chance of cross contamination and user error, while using cheaply and sustainable materials.

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131 9:35 am

Open channel and managing stormwater

ahmed shubar, Civil Engineering (U)

It talks about the cross section areas of an open channel and how much flow it can get without cousing any flood. Also, it talks about managing the stormwater and how we benifit from that.

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132 9:50 am

Evaluation of Urban Flooding with Remote Sensing and Machine Learning

Vincent O'Hara-Rhi, Civil Engineering (M)

Flooding in urban areas, especially in low-income or disadvantaged communities, poses a serious problem to drivers, even at depths usually associated with Nuisance Flooding. While techniques exist to map and predict flooding extent, a knowledge gap exists in accurate mapping and prediction of urban flooding. It is important that agencies and individuals be given an understanding of how much flooding a region may experience given a certain weather event, so that drivers may preemptively avoid flooded areas. This paper synthesizes several approaches to build an understanding of the spatial extent of urban flooding in the city of San Diego, California. First, flooding reported during major storms was used as validation data for a Generalized Linear Regression model to create a map of flood risk. Then, a Support Vector Machine model was used to extract areas of possible flooding from a COSMO-SkyMed image taken during a heavy storm. Finally, the performance of the original GLM model was compared with a new model that used both reported flooding and flooded areas extracted from the SAR image as inputs. Each model provided robust and meaningful results, the Generalized Linear Model indicating which areas of the city are most at risk for flooding and the image classification Support Vector Machine algorithm successfully picking out water bodies during both dry and wet conditions. A comparison between final results showed correlation between the two; areas found to be flooded during the storm were also areas found to be at a high risk for flooding.

133 10:05 am

A Holistic Work Zone Safety Approach using Wearable Technology

Farid Shahnavaz, Computational Science (M)

Road and highway work zones pose many safety risks to the construction workers. Fatal injuries resulting from traffic accidents due to vehicle speeding near work zones are common safety risks to the workers. Injuries such as hand-arm vibration syndrome because of the exposure of the excessive vibration and repetition using tools and equipment such jackhammer, soil compactor, and electric drill are common among work zone construction workers as well. Advanced technologies such as wearable sensors can help reduce the risk to workers in these situations. In this research, a real-time framework that uses smartphones as wearable and communication nodes is used to identify the risk factors leading to work zone safety threats and warn the workers who are exposed.

This project aims to improve both internal and external safety of work zone workers, which makes this approach holistic. The internal safety refers to ergonomics, and the external safety deals with speeding vehicles approaching toward work zones. In the first step, ergonomic benchmarks for excessive vibration and repetition (i.e., two health and safety risks common to construction work zones) are established. These benchmarks are determined based on relevant international occupational health standards and reports such as the ones prescribed by the American National Standards Institute (ANSI), the National Institute for Occupational Safety & Health (NIOSH), and the International Organization for Standardization (ISO).

An Android mobile application is developed to measure vibration intensity using the onboard accelerometer sensors of smartphones. The application sends collected data to the cloud in real-time for processing to determine if the vibration levels exceeded the safe threshold using the values calculated as per the standards above. Workers working with tools such as jackhammers wear smartphones on their arms arm and the vibration of the body and thus the phone and embedded sensors will be captured. As the data is analyzed in the cloud, the smartphone can warn the worker to stop or take a rest when the amount of vibration exceeds a predefined threshold. Preliminary results indicate that the mobile application can accurately detect instances of unsafe vibration. The speed detection algorithm part is currently under development.

134 10:20 am

Unmanned Aerial Systems (UAS) Impact on Driving Distraction

Newsha Emaminejad, Civil and Construction Engineering (M)

The rapidly growing use of Unmanned Aerial Systems (UAS), especially in civil and construction applications, presents many opportunities for numerous remote operations, which are more efficient, safer, and cheaper. However, flying UAS can potentially cause disruption and distraction to other surrounding activities. Therefore, while UAS can enhance safety, there are safety-related issues associated with them that are yet to be addressed. Indeed, many civil and infrastructure applications of UAS including traffic monitoring, job site monitoring, infrastructure mapping and surveying, and structural inspection are in proximity of roadways and have the potential risk of distracting drivers. In this research, a driving simulator experiment involving roadside UAS operations was developed to assess the extent of this distraction. Eye movement consists of fixations and saccades were analyzed using Pupil eye-tracker data acquired from 30 participants. Each participant experienced 8 scenarios over the course of a 20 to 30 minutes drive. This study pursued two main goals: (1) evaluate the impact of drone existence on drivers' distraction and (2) compare visual attention during drone event exposure and baseline visual attention and between visual attention during drone exposure while facing different surrounding conditions. The results of the analysis revealed the most crucial parameters affecting the distraction level of drivers. These parameters include but not limited to lateral distance, weather and lighting conditions (i.e., fog with specifiable distance, day/night, and clear/rain/snow), and drone speed. Based on these results, having a negative lateral distance (i.e., flying over cars) can significantly increase the probability of the driver being distracted. The findings of this study are useful for transportation and aviation officials as they establish regulations, statutes, and procedures governing UAS operations.

Session A-7

Oral Physical and Mathematical Sciences 1

Friday, March 4, 2022, 9:00 am

Location: Legacy Suite

135 9:05 am

Photocatalytic and electrocatalytic upcycling of polyethylene terephthalate to H2 and valuable chemicals

Audrey Washington, Chemistry (U)

Plastic pollution is one of the most pressing and widespread problems affecting the environment. At the same time, plastics are a largely untapped resource for manufacturing and fuels. Polyethylene terephthalate (PET) is produced ~70 million tons annually, however, only less than 20% of them are recycled, mainly via mechanical methods. Chemically, PET is typically recycled under harsh conditions (basic conditions, high temperature) to yield high-value products.[1] Herein, our study centers upon sustainable photocatalytic and electrocatalytic techniques that is capable of upcycling polyethylene terephthalate (PET) to H2 fuel and value-added chemicals (formate). More specifically, a cheap non-toxic carbon nitride/molybdenum disulfide (C3N4/MoS2) photocatalyst is exploited to photocatalytically decompose PET under ambient conditions. Several PET decomposition products were detected by proton nuclear magnetic resonance spectroscopy (1H NMR). In addition, the electrochemical decomposition of PET, which is achieved by applying transition-metal (TM) layered double hydroxide (LDH), is coupled simultaneously with the clean H2 generation at the cathode. This work demonstrates a sustainable alternative to implement PET waste upcycling to value-added products and H2 fuel.

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136 9:20 am

Impacts of Climate Change on Extreme Fire Weather

David Rother, Geography (D)

One of the most valuable tools for assessing historical and projected climate variability, especially the meteorological variables that govern wildfire on a regional scale, are global climate models, or GCMs. While GCMs are critical for the evaluation of long-term variations in climate, there are significant limitations to their use for the study of wildfire impact assessment and fire weather potential. The main limitation is that climate model output is typically coarse resolution and is subject to significant bias. One method of adjusting for the resolution of available GCM output to that which is needed for the evaluation of fire weather variables is downscaling. Downscaling is a method that allows for the reduction in systematic biases inherent to numerical weather prediction systems, as well as an enhancement of grid cell resolution in order to account for the effects of topography and other land surface features. The fundamental idea behind statistical downscaling is the establishment of statistical relationships between coarse scale GCM output (for temperature, precipitation, etc) and fine-scale local observations. These statistical relationships are then applied to GCM projected data as a means to predict the fine scale local climate characteristics in the future. In order to track changes in, and probability of, extreme fire weather risk over time, fire weather indices are often calculated using observational data or global climate output. The objectives of this research are: 1) obtain fire weather variables (precipitation, wind speed, surface air temperature, relative humidity) for a historic (1979-2014), mid-century (2041-2070), and late-century (2071-2100) period from three CMIP6 models; and 2) bias correct and statistically downscale (BCSD) four fire weather variables using gridMET observational data; and 3) calculate two fire weather indices using BCSD data from three climate models for the historical and projected periods; and 4) quantify spatial and temporal trends in maximum temperature, VPD, precipitation, and fire weather indices, and assess the difference between the historical and projected periods; and 5) calculate the exceedance of FWI above a 95th percentile value in the historic and projected periods to quantify impact of climate change on the occurrence of extreme fire weather days.

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137 9:35 am

Spectral Unmixing Techniques Examined for Analysis of Herbaceous Fractional Cover in Wildfire-Prone Shrublands in Southern California, USA

Krista West, Geography (D)

Southern California's native coastal shrubland ecoregions are being replaced by invasive herbaceous vegetation species that contribute to an increased risk of wildfire ignition and spread. When herbaceous species invade, grow in the Spring season, and senesce and die in the Fall season, they become flammable fuel. Ultimately, the expansion of these competitive invasive species can completely convert and replace the native shrubs and trees, which thereby increases the likelihood of future wildfire that can spread rapidly and widely through a positive feedback loop called the "grass/fire cycle." Despite the risk posed by the presence of herbaceous vegetation, image processing approaches for identification and quantification of fractional herbaceous cover in Southern California shrublands are not well established. This study's objective is to determine how well moderate spatial resolution multispectral remote sensing data can be used to accurately extract information from, classify, and estimate fractional cover of herbaceous vegetation to identify wildland-urban interface (WUI) areas that are at risk of fuel-driven wildfires. Landsat 8 Operational Land Imager satellite data were acquired over San Diego County during each season of 2020, and the performance of developed spectral unmixing techniques (spectral mixture analysis (SMA), multiple endmember SMA (MESMA), and temporal mixture models (TMM)) were tested. Data were spatially subset to focus on the County's WUI shrublands that contain all land cover classes of interest (herbaceous, true shrub, subshrub, and bare ground), and where field work was performed (2020-2021). Unmixing tests included Single Date and Multi-Date (for intra-annual analysis) input data, and inputs of different Spectral Band and Spectral Index (Normalized Difference Vegetation Index (NDVI) and Normalized Difference Infrared Index (NDII)) combinations. Preliminary results demonstrated that the Multi-Date Spectral Band input performed best and most closely resembled reality from San Diego County for all land cover classes of interest. The methods developed here will enable improved detection of sensitive habitats by satellite for wildfire-prone communities and identify target areas for mitigating and combatting the grass/fire cycle.

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138 9:50 am

Evaluating the Regional Climate Impact of Secondary Forests in the Brazilian Amazon

Mallorie Honey, Geography (M)

While climate change research largely focuses on greenhouse gas emissions, human alterations of the terrestrial environment impact local temperature and precipitation patterns. Although disruptions to the land-atmosphere energy balance caused by deforestation have been extensively studied, the climatic impacts of secondary forests-defined as forests growing in disturbed landscapes-remain poorly understood. In this study, we evaluate the climate change mitigation potential of secondary forests in the Brazilian Amazon, analyzing changes in land surface temperature (LST) and evapotranspiration (ET). Through examining remotely sensed land use and climate data, preliminary results indicate that LST and ET can return to pre-disturbance levels in as little as ten years, though recovery time is determined by a variety of spatial and ecological factors.

139 10:05 am

Brazilian Amazon Deforestation Impact on Dry Season Climate

Corrie Monteverde, Geography (D)

The Brazilian Amazon provides many ecosystem services and functions as a global and regional buffer for the climate. Historically, this region has been deforested for its timber, cattle ranching, and other purposes. There has been a recent uptick in the rates of deforestation due to socio-political reasons. This research focuses on the development of a new deforestation map, based on indigenous lands and unprotected forests and uses a regional climate model to simulate land cover changes from forest to a pasture-like setting. Simulations are run for a three-year time period from 2018-2020 for April-October with a focus on the dry season when impacts of deforestation and lack of precipitation are especially important for agriculture. Results will focus on variables and indices pertinent to the farmers of the region, as water and temperature play a large role in agricultural suitability.

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140 10:20 am

LCLUC Impacts of Arctic Oil/Gas Exploration

Avi Martin, Geographic Information Science and Technology (U)

Arctic ecosystems are sensitive to human activity. Nowhere is this more evident than in the case of large-scale industrial development and infrastructure failures, as recently (May 2020) highlighted by widespread ecological degradation caused by an oil spill in Norilsk, Russia. Understanding the history of such development is key to determining its environmental impacts. Here, we determine the history and geography of fossil fuel exploration in North Slope Borough (NSB), Alaska and Yamal Peninsula, Russia. To do so, we first conduct a thorough literature review using SDSU's OneSearch database, as well as Google Scholar and similar online tools. Once compiled, historical records will be synthesized with independent geospatial and remote sensing observations to map the impact of oil and gas exploration on permafrost degradation, as well as associated effects on terrestrial ecology and surface hydrology. Results will be integrated into social science models to identify and forecast vulnerabilities of eight underserved communities in NSB, Alaska associated with energy expansion by National Petroleum Reserve-Alaska and the Alaska National Wildlife Reserve. Socioeconomic models for NSB will be built off existing frameworks developed for earlier research in Yamal, but extended to also include region-specific analysis of infrastructure development. This research responds to the United Nations Environment Program call to action to identify regions most susceptible to permafrost degradation, and will also help develop measures to mitigate the impacts of expanding oil and gas infrastructure on susceptible communities. This work will support ongoing research funded by NASA's Land Cover-Land Use Change program (solicitation NNH21ZDA001N).

Session A-8

Oral Creative Arts and Design / Visual or Performing Arts 1

Friday, March 4, 2022, 9:00 am

Location: Pride Suite

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141 9:05 am

Women in Leadership Roles: Classical Voice / Opera

Jade Popper, Music (M)

The purpose of this research is to amplify the stories, understand the challenges, and create a discussion for women in leadership positions within the field of classical voice. In this qualitative study, I have conducted interviews with two female leaders in the industry. We met on Zoom, I asked questions about entering leadership, their backgrounds, and any trials they may have overcome. I was connected to these female leaders through my personal resources at the university where I study. Within the parameters of this small-scale study, I found common threads in each of these women's professional and personal journeys. Both women have faced challenges in their personal family life by choosing a career in professional Opera singing. Additional themes include body-shaming, starting in music at a young age, and female role models in their early careers. Based upon results from this study, it appears for female leaders, there is still implicit bias and sexist expectations. However, as the field becomes more aware, there are signs of positive change.

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142 9:20 am

Examining Experiences in College Music Theory Courses Through the Lens of Different Primary Instrument Groups

Barbara Macz, Music Global Composition (M)

The purpose of this quantitative study is to examine the impact of an undergraduate music student's primary instrument on their music theory course experience. These courses require strong analytical skills, pattern recognition, and notation literacy. However, since written music is presented differently according to instrument type, I hypothesized that pianists and guitarists, whose instrument structure physically allows them to play (and, therefore, read) simultaneous notes while also often engaging with "chords" (three or more different notes played at once, the movement patterns of which are central to studying music theory), would have a more positive experience and coursework advantage over other instrumentalist groups. This study sought to examine the specific research questions: (1) what preparations for theory courses are music students engaging with prior to entering college, (2) how do music students fare with fundamental musical skills and concepts after experiencing the college theory course sequence, and (3) is a student's primary instrument a reliable predictor for success in an undergraduate college music theory course. An online survey was created based upon precious literature (Baker & Kosar, 1992; Berry, 2013; Johnson, 2010; Livingston & Ackman, 2003) and was used to poll 90 participants. Data revealed that, prior to college, 21% (n=19) of students were either not exposed to theory concepts at all or were only exposed to music theory through self-study or YouTube videos. Percussionists and brass players felt most comfortable with chord-based concepts considered to be more advanced in the theory course sequence. At the same time, percussionists, brass players, and especially guitarists, found their coursework to be least engaging and relevant. There was no correlation between overall course experience and grades achieved. These results indicate that the primary instrument is not an indicator of music theory experience or coursework success, however researchers may want to further investigate additional variables that may impact these experiences for students, such as gender or early age musical training and experience.

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143 9:35 am

The Intertwined Experience of Sound and Vision

Nathaniel BeuMaher, Jazz Studies (U)

During a live concert the audience is able to see the musicians performing on their instruments, which provides a visual context for the sounds being produced. In this way the music is first presented visually before the audience hears it. When we see a guitarist strum the strings, we understand that we are hearing a guitar. In contrast, during a performance where the sounds are produced by an electronic device instead of a performer playing a traditional instrument, the visual cues that help an audience member understand the source of a sound are gone.

The acousmatic experience is a mode of listening in which the sounds being presented lack a recognizable source, so the listener perceives the individual sounds as disembodied autonomous objects. The study of acousmatics is based on the work of sound engineer Pierre Schaeffer, who was one of the first composers to work with the manipulation of magnetic tape recording in the 1950s. Thanks to subsequent developments in recording technology, sounds can now be created, sampled, and edited live with equipment that is on stage with the performer, in plain view of the audience. How does the visualization of sound producing media in the electronic realm relate to our experience watching acoustic instrumentalists or vocalists? In 2019 ambient music composer Hainbach created an art installation consisting of three totem-like structures constructed from obsolete scientific test equipment. These totems were wired together and controlled by Hainbach for a musical performance in a gallery, where the equipment was visible to audience members. These “Landfill Totems” are a useful tool for examining the relationship between Schaeffer’s classification of “acousmatic” and the increasing use of electronic technology as musical instruments in contemporary culture.

144 9:50 am

Examining Technology’s Influence on the Values of Bedroom Pop Artist Lyn Lapid

Dennis Henry Monsalud, Music Education (U)

The recent development of powerful new technology, especially in personal computing devices, has greatly impacted techniques of music production and, more importantly, who is able to create and distribute high quality music. Instead of relying on the exclusive and expensive practices of the commercial music industry, which tend to limit the creativity of amateur musicians for the sake of a profit-oriented product, young artists are increasingly turning toward independent music making at home. Even before the pandemic drove musicians into social isolation, these entrepreneurial artists have been producing their songs using modest equipment in their homes, which is contributing to an emerging musical genre known as “Bedroom Pop.” By examining the phenomenon of one Bedroom Pop artist, Lyn Lapid, I will explore how the widespread availability of music technology radically changed the dynamic between the professional music industry and domestic music making. After outlining Lapid’s musical activities, including her struggle with the music industry and her robust social media presence, I will describe the cultural practices of Bedroom Pop and highlight its ideological conflict with mainstream popular music. I hope this project contributes to a deeper understanding of how contemporary technology is not only providing a creative outlet for individual artists, but also forming a thriving and sustainable musical community.

Abstracts of Presentations

Session B

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UNIVERSITY

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Session B-1

Oral Behavioral and Social Sciences 4

Friday, March 4, 2022, 11:00 am

Location: Park Boulevard

145 11:05 am

Seeking Crisis Information

Phillip VanderWeit, Masters of Arts in Communication (M)

During crises, public safety organizations must provide timely and accurate information to the public. Due to an active audience's growing appetite for immediate information, public safety organizations communicate via social media in order to protect and inform their publics. The decision to seek crisis information from an organization is likely dependent on an organization's ability to leverage social media to provide timely and accurate information.

Studying this topic from the digital citizen's perspective and through the lens of uses and gratifications theory builds upon prior research in the field of crisis communication. An abundance of research exists that addresses uses and gratification theory as it applies to advertising, entertainment, and education. However, there is further opportunity for its application to the effects of crisis communication using social media.

Using survey data to better understand the digital citizen's perspective, this research identified an active audience's cognition needs and decisions when choosing sources of crisis information on social media. This researcher seeks to understand the following key concepts: crisis information-seeking, gratification of cognition needs, social media word-of-mouth, news media literacy, and information verification in a crisis setting. This study contributes to research that focuses on why consumers use social media and informs organizations' efforts to improve interactions with an active audience through various social media.

146 11:20 am

Employee Experience Through Digital Transformation

Manahil Nasim, Management Information Systems (U)

Digital Transformation (DT) is becoming an impactful component in the functioning of public institutions, due to its ability to streamline communication and make data readily available--increasing an organization's productivity. Some of the top priorities of the government, which include maintaining social programs and monitoring economic changes, can be better managed through the use of digital technologies [1]. However, the enhancement of public institutions through digital transformation may be purely theoretical, rather than reality, when organizations fail to center the viewpoints of government employees when incorporating new digital technologies, as employee mindsets often play a major role in adherence to an organization's digital transformation initiatives [3]. For instance, employee disengagement, resistance to change, and a lack of rewards (that are tied to digital transformation) are all examples of the ways that employees impact the development of digital transformation [6]. Due to the impact of employee perception on the success of digital transformation, it may be an effective technique for public institutions to incorporate digital technologies that center employee experience, emphasizing employee autonomy and active participation.

147 11:35 am

DataSwagger: A Systemic Approach to Train, Motivate and Engage Data Savvy Employees

Robert Brodskiy, Management Information Systems (U)

The relevance of data literacy has increased substantially over the past three decades. When trained well, data-literate employees at all levels can make data-driven decisions, improving the overall performance of their organization. Utilizing Transformative Learning Theory(TLT) and Experiential Learning Theory(ELT), this paper proposes a systematic data education framework for increasing data literacy across organizations. Focusing on the needs and experiences of non-expert end-users, this model proposes the following four learning strategies in data literacy training design: experiential data training, critical incident reflection, rational open discourse, and autonomous experimentation. To inform this model and further investigate barriers to data literacy in organizations, interviews were conducted with individuals from two different data analytics units in the U.S. Department of Defense. This research provides key insight and practical suggestions for developing and improving data literacy training programs.

148 11:50 am

Nourishing & Encouraging Digital Intrapreneurship Behavior

Ivan D Ortiz Sandoval, Business Administration Marketing: Specialization In Imc (U)

Digital intrapreneurs (DIs) act and behave in a similar way to typical digital entrepreneurs without the risk of the venture. DIs' behavior, however, are under influence of different organizational factors. This study is meant to focus on the relationship between digital intrapreneurship behavior and the workplace climate—specifically, on how the workplace climate can influence their ability to innovate and exploit digital technologies. While current innovation literature highlights the role of employees in innovation, it falls short in explaining the behavioral aspects of digital intrapreneurship affected by contextual factors.

digital intrapreneurship

The individual factors are represented by motivations, digital literacy, goals, needs, and the DI's mindset. The motivations associated with DIs are both extrinsic and intrinsic motivations. We found that by being internally motivated, their productivity and creativity will increase. We also found the different goals/needs that a DI has, are influenced by the idea that because of their position they can act risk free. This brings us to their mindset, as they are known to be self-efficient, meaning they believe in their ability to succeed at any given tasks. We also found that digital literacy enables DIs to be literate in everything related to innovative technology.

The individual factors are influencing the different situational factors which consists of collaborative norms, work climate, and group dynamics. Collaborative norms refer to the multiple interactions that a DI will encounter while working in a digital environment. Work climate is as important as collaborating with other people. By having a welcoming and engaging atmosphere, we argued that the DIs will thrive in their overall creativity, motivation, and productivity. In parallel, group dynamics is defined by how coworkers act around a DI, which will define the culture of the company.

This correlates with Organizational factors: mission, core values, and reward system. The mission of the company will have an impact on DIs since it will lead them to work towards a common goal. The mission of the company is linked to their core values as the company needs to make sure that their employee embodied a certain mindset to achieve the common goal. This has an impact on DIs as they must be the first one to embody these values because they are supposed to represent their company. Another area of the company that impacts DIs is the reward system.

Technological factors including digital infrastructure plays a key factor in the relation of the DI and DI activity. Digital intrapreneur infrastructure refers to the physical and

Digital innovation has facilitated yet created new norms for uncertainty. As the crux of DI, digital innovation allows for intrapreneurs to explore without the risk while also providing a competitive advantage to withstand the inconsistencies in the DE climate. As important they are, it is imperative to nurture DIs. Our studied revealed that three key factors play into the formation of behavior: Individual,Situational & Organizational factors. 1 organizational structures, and the facilities needed for the practice and operations of digital intrapreneur activity. Work practices include innovation routines, incentives, and empowerment which stimulate the DI. These relate to the immediate work environment in which stimulate DI activity such as interaction, engagement, collaboration, and exploration. Work practices are to motivate and influence positive DI activity. The work practices influence the process of digital Intrapreneurship such as: digital technology, exploitation, ideation, experimentation, validation, and commercialization. DI is the act of engaging as a DE without the risk and taking an innovation from an idea to commercialization. The ability for DI to experiment allows the DE to inhouse innovation and minimize risks taken through trial and error. The effectiveness relies on the – availability, accessibility, affordability, and technical support of digital technologies. Allowing DI, the optimal use of such technologies support and encourage DI to progress in their activity.

The ability for a DI to exploit technologies without the risk of entrepreneurship removes the fear of failure and opens the door to possibilities. The workplace infrastructure provides the external motivation, inspiration, and tools needed for DI. While the workplace organization culture is the external encouragement. It is important to note the DI individual (internal) factors may influence the ability, skillset and activity acted. Which is why it is important to ensure all external forces nourish DI and encourage DI activity.

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149 12:05 pm

Digital Entrepreneurial Mindset

Timothy Seitola, Masters of Business Administration: Information Systems (M)

The study aims to theorize the concept of Digital Entrepreneurial Mindset as the core quality of digital intrapreneurs and identify its antecedents and outcomes. To this end, we examined the recent developments in entrepreneurship research, behavioral psychology, and educational studies and evaluated the current conceptualizations relevant to our inquiry. We also scrutinized the relationship between entrepreneurial mindset and intrapreneurship behavior to characterize digital entrepreneurial mindset (DE-Mind) more accurately. As a result, this study provides a more comprehensive definition of DE-Mind and offers a unique analytical perspective to the ongoing conversation about the importance of entrepreneurial mindset in our rapidly changing digital economy.

Early conceptualizations of mindset arose from cognition and organizational theory, looking at it as a cognitive screen through which considerations of action were made. However, current conceptions of mindset preclude a “one-size-fits-all” approach to defining it. Moreover, recent studies on entrepreneurial mindset have primarily focused on refining and categorizing it by its action-oriented facets; however, these efforts fall short in accounting for how this mindset develops in a digital context. Therefore, this study offers a context-specific definition of mindset as the cognitive adaptability to direct personal attention, experience, and behavior towards exploring, evaluating, and exploiting digitally enabled opportunities within a business domain. We argue DE-Mind partly defines how individuals perceive, interpret, and respond to these opportunities, and therefore, it can predict digital intrapreneurship behavior. This conceptualization also helped us to identify the key antecedents of DE-Mind, namely Digital Aptitude, Digital Literacy (Know-What, Know-How, and Know-Why), and Digital Entrepreneurial Self-Efficacy. The identification of the DE-Mind antecedents and outcomes allowed us to propose and validate an instrument for assessing an individual’s capacity to develop DE-Mind and predict the individual’s intrapreneurial potency in a digital context.

Our DE-Mind antecedent-outcome model and the accompanying instrument also present notable practical implications. We argue that digital intrapreneurship is essential to digitally transform a business. However, the success of digital intrapreneurship is determined in large part by hiring and engaging talents with the right mindset and cultivating a culture that organically nurtures DE-Mind. Our model offers a practical way to identify these talents throughout the hiring process and suggests a unique way to foster DE-Mind by investing in digital aptitude, digital literacy, and digital entrepreneurial self-efficacy through meaningful training programs. Equally important, our study proposes a roadmap to recognize the digital intrapreneurs and empower them to lead digital innovation initiatives. Lastly, our study offers an agenda for future research toward understanding digital intrapreneurship behavior and its supporting systems.

150 12:20 pm

Reflectiveness in Digital Environments: The Missing Link Between Mindfulness & Productivity

Melissa Klase, Psychology (U)

The COVID-19 pandemic has transformed the nature and organization of work. As businesses have shifted their workforce to remote work overnight, technology continues driving productivity in the post-pandemic world. This unprecedented reliance on digital technology has its costs; while productivity overall is on the rise, so is digital fatigue. Digital fatigue is influenced by characteristics in general job demands as well as non-work demands that spill over into work time such as avoiding distractions from technology and the decrease in sustained attention. Prior studies documented that mindfulness in digital environments is crucial in maximizing technological potential and improving meaningful technology use. However, the link between digital mindfulness, as a state of mind, and mindful action in a digitally enabled workplace is not yet well explored.

This study explores how digital mindfulness can help reduce digital fatigue and associated burnout without compromising productivity. This study is an attempt to understand whether digital mindfulness can lead to a state of mind where employees intentionally optimize technology use through evaluating contextual factors and reflecting on their performance. Reflection at the state of self-awareness allows employees more effectively analyze their thoughts and feelings, as well as their environment. This study introduces reflectiveness as a mediating variable between mindfulness and mindful action. We argue that digital mindfulness without reflectiveness does not necessarily reduce digital fatigue or enhance productivity. More specifically, mindfulness in the absence of reflectiveness only leads to a temporary state of mind (short-term alertness or awareness) without a maintainable effect on mindful actions—for example, due to the frequency, continuity, visibility, and variety of digital stimuli.

This analysis can result in knowledge integration and developing new perspectives that are essential for mindful action over time. Reflectiveness on feedback or experience is also an important factor driving implementation intention toward managing one's environment and self-regulation. Therefore, we postulate that mindfulness practices in digitally enabled workplaces can reduce digital fatigue only if these practices are linked to self-initiated reflection on different aspects of digitalization such as cognitive, relational, emotional, behavioral, and temporal consequences of the technology use.

Session B-2

Oral Behavioral and Social Sciences 5
Friday, March 4, 2022, 11:00 am
Location: Mata'yuum

151 11:05 am

How Neural Measures of Attention Relate to Visual Working Memory Capacity and Trait Anxiety

Marisa Krauter, Psychology (U)

Both trait anxiety and visual working memory capacity have been previously associated with attentional suppression. Using electroencephalography (EEG), attentional suppression can be indexed with the distractor positivity (PD) event-related potential (ERP) component. Our previous research has shown that in emotional contexts involving threatening stimuli, heightened anxiety is associated with increased attentional suppression. Researchers have also found individual differences in visual working memory capacity that correlate with the magnitude of attentional suppression. However, little is known regarding the relationship between visual working memory capacity and trait anxiety. The present study examined the relationships among attentional suppression, visual working memory capacity, and trait anxiety. Sixty neurotypical young adults participated. Trait anxiety levels were assessed using the State-Trait Anxiety Inventory questionnaire. EEG was recorded while participants completed both a change localization task to assess visual working memory and a singleton capture task to assess attentional suppression. The correlations among measures of visual working memory capacity, attentional suppression, and trait anxiety will be examined. The results will improve our understanding of the relationships among visual working memory, attentional suppression, and trait anxiety.

152 11:20 am

Phonetic Variation During Speech Production in Spanish-English Bilingual Adults - An online experiment

Andrea Galvez-McDonough, Speech, Language, and Hearing Sciences (U)

During word retrieval, parallel activation of both languages in bilinguals can result in cross-linguistic interaction. False cognates (words that are phonetically similar but semantically different across languages), can create cross-linguistic interference during naming, increasing errors and lengthening reaction times (RTs). The present study examines how Spanish-English bilinguals retrieve words and what patterns of phonetic variation are observable during Spanish speech production depending on language dominance and the presence of cross-linguistic interference. Phonetic deviations during naming are instances where productions are phonetically similar but not identical to the target response (e.g. “a.ˈseiˈ. te”-”xa.ˈseiˈ.te”). Sixty adult participants completed a series of online tasks. Subjective and objective measures of language proficiency, which were combined into a language dominance index, were obtained through the Language Experience and Proficiency Questionnaire (LEAP-Q) and the Multilingual Naming Test (MINT). Participants named images in a picture word interference task where they were presented with an image and a to-be-ignored word centered on top. Target images (e.g., picture of oil) and distractor words were presented in one of three conditions: false cognate (distractor word “ola”, English wave), unrelated (distractor word “candado”, English lock), and identity (distractor word “aceite”, English oil). We hypothesized that the false cognate condition would elicit lower accuracy rates and longer RTs, and that the more English-dominant participants would have a higher number of phonetic deviations than the more Spanish-dominant participants when naming pictures in Spanish. Results show the expected cross-linguistic interference effect on error rates, as well as an effect of condition on RTs due to the identity condition yielding faster RTs than the other conditions. The number of phonetic deviations negatively correlated with participants’ language dominance indices, with no effect of condition on the presence or absence of deviations. This indicates that, as predicted, the more English dominant someone was, the higher the number of phonetic deviations they produced while naming in Spanish, even in contexts without cross-linguistic interference. Our results indicate that assessing cross-linguistic interactions during word retrieval and phonetic variations in production in online experiments is feasible and yields the expected effects.

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153 11:35 am

Managing Direct Complaints in Everyday English Conversation

Abigail Coulson, Linguistics (U)

Complaining as a social action has been a topic that has long attracted the interest of scholars in many fields, such as linguistics, communications, and psychology, among others. Complaining has in general been characterized as a face-threatening act (e.g., Brown and Levinson (1987 [1978]), in that it has the potential to damage the speaker’s positive face, or desire to maintain a consistently positive self-image to other participants. In American culture, where people tend to uphold an interlocutor’s positive face, complaining can be considered as a social action that can possibly harm, and even jeopardize interpersonal relationships. It remains an interesting research question as to how participants manage complaining in naturally occurring conversation. This study focuses on complaining in everyday English conversation, and specifically how participants manage and respond to direct complaints. By “direct complaints”, we mean complaints that are targeted directly at someone who is present in the current social interaction. In this project, we used a corpus of approximately 16 hours of audio- and video-recorded English conversation acquired and furnished by Dr. R.J.R. Wu. These conversations were collected and recorded in the US amongst friends, family, and coworkers. Altogether, we collected and compiled a database of a total of 250 instances of direct complaints after carefully transcribing and examining 11 hours of data. Our preliminary results show that despite its potentially detrimental effect on interpersonal relationships, direct complaint appears to occur more frequently in English conversation than previously thought. We will show how participants strategically manage and respond to direct complaints in everyday social encounters as well as interactional consequences associated with different strategies.

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154 11:50 am

A Novel Sentiment Analysis Approach for Investigating Empathic Communication in Adults with Chronic Musculoskeletal Pain in an Outpatient Physical Therapy Setting

Chelsea Chapman, Public Health (D)

Empathy is essential to delivering quality care in the physical therapy management of chronic musculoskeletal pain. Research on empathic communication in physical therapy is limited and restricted to small qualitative datasets. This study aims to develop and validate a novel method for identifying patient emotional communication and physical therapist empathic communication with acceptable accuracy and improved efficiency compared to manual coding. A purposive sample of adults with chronic musculoskeletal pain (N=34) and their physical therapists (N=6) were selected from a prospective observational study. These dyads were audio recorded during initial evaluation and 3 treatment sessions across 6 weeks. Audio files were transcribed using NVivo. Six trained investigators manually double-coded transcripts for patient emotions and physical therapist empathic or non-empathic responses using a codebook of inclusion rules developed by consensus. Manual coding time was recorded for each coder. Audio file length to manual coding ratios were calculated. Using R version 4.0.3 with the ‘SentimentR’ package, we conducted natural language processing of transcribed speech from the same data set to quantify and locate emotional communication. Jockers–Rinker sentiment and NRC Emotion lexicons and analysis processes were pilot-tested in single transcript files. The sentiment analysis technique will be tested in the manually coded dataset and iteratively updated until 65% accuracy is reached, an acceptable level in lexicon-based techniques. We will also compare manual coding time ratios to the sentiment analysis approach to determine efficiency of the novel analytic method. Preliminary findings indicate that across 6 independent coders among 12 sample transcripts, manual coding to audio file time ratios averaged 1.41. Through pilot-testing single transcript files, sentiment analysis parameters relevant to the physical therapy setting and chronic pain population have been identified. Once validated, the proposed analytic approach will be the first to investigate empathic communication in large longitudinal datasets of patient-provider interactions in a clinical practice setting. This method’s increased efficiency will ultimately allow researchers to study how empathic communication evolves, and how the quality and timing of emotional and empathic communication between patients and their health care providers influence health outcomes. Research supported by NIH grant 1F31HD101274-01.

(U) = Undergraduate ; (M) = Masters ; (D) = Doctoral

155 12:05 pm

The impacts of COVID-19 on mental health, well-being, and beliefs among the San Diego State University population

Jennifer Adams, Public Health (U)

Statement

In recent years, COVID-19 has greatly impacted and altered the delivery of education (e.g., Zoom or Microsoft Teams) and the day-to-day life of students and staff in the world of academia. This study aims to examine how COVID-19 has impacted the mental health, well-being, attitudes, and beliefs among the San Diego State University (SDSU) student, staff, and faculty population.

Methods

The current study expands upon preliminary results from a faculty and student-led School of Public Health mixed-methods research project (PH 499) at SDSU. Initial results indicated that SDSU students are suffering from increased stress, anxiety, and an overall deteriorated quality of life. In response to these findings, we are conducting a mixed methods survey that expands this study to include SDSU students, staff, and faculty. Additionally, we assess participants' thoughts about SDSU's response to the COVID-19 pandemic and transition to in-person classes. Data collection for the study began Fall 2021 and will be completed in February 2022. Analysis will conclude March 2022. Quantitative analysis includes descriptive statistics and cross tabulations analyzed using Excel and SPSS in order to assess prevalence, trends and potential patterns. Qualitative analysis data is content coded and assessed for major themes about COVID-19 mental health and SDSU's response.

Outcome(s)

We will analyze the following self-reported outcomes; (a) the impact of COVID-19 on the mental and physical state of the SDSU population; (b) whether students and staff feel safe on campus; (c) how COVID-19 has affected the quality of education that is delivered at SDSU.

Results indicate that SDSU students are suffering from increased stress, anxiety, and an overall deteriorated quality of life. We will present both quantitative and qualitative data. Most importantly, we will present actionable recommendations based on the data.

Summary

This study provides a voice for the SDSU population regarding COVID-19 and to improve student and staff health, both mentally and physically, at SDSU.

156 12:20 pm

Social Networking Site Usage and Needs: Effects on Social Connectedness and Perceived Loneliness During the COVID-19 Pandemic

Mary Botrous, Psychology (U)

With the efforts to mitigate the spread of COVID-19, stay-at-home orders and social distancing guidelines were implemented to slow the spread of the virus. These behaviors created social and physical isolation that compromised the mental health of many and increased psychological distress. However, social networking sites (SNSs) are one such tool that have allowed people to connect virtually while continuing to maintain social distance. The goal of the current study was to examine the role that SNSs play in college students' feelings of social connectedness and isolation in Spring 2020 of the COVID-19 pandemic. Participants (N = 387) were undergraduate students aged 18 to 41 (M = 19.93, SD = 2.33). The participants completed an online survey that assessed SNS usage and needs (i.e., diversion, cognitive, affective, personal integrative, and social integrative), feelings of social connectedness, and perceived loneliness for course credit. It was hypothesized that the more a student's SNSs needs were met, the more socially connected they would feel, which would in turn, be related to lower perceived loneliness. Results showed that the more cognitive, affective, personal integrative and social integrative needs were met with SNSs, the more socially connected participants felt, which was associated with lower perceptions of loneliness. All of the needs, except for diversion needs, significantly predicted social connectedness. Interestingly, diversion needs being met was related to more perceived loneliness. During the Spring of 2021, the use of SNSs met a variety of psychological needs, provided social connection, and was related to lower perceptions of loneliness for college students. Although the SNS scale was not a measure of coping strategies per say, the current study found that a variety of psychological needs were met with SNS usage highlighting the potential coping-like benefits of SNS. Future studies should explicitly explore the convergent and discriminant validity of the SNS with other measures like coping, growth, and resilience as they apply to the instrumentality of SNSs. It is important to understand what exactly these needs are fulfilling and how they can help or hurt mental and physical health.

Session B-3

Oral Biological and Agricultural Sciences 2
Friday, March 4, 2022, 11:00 am
Location: Aztlan

157 11:05 am

Role of macrophages in activation of NF-kB in ovarian tumor-initiating cells

Denay Stevenson, Cell and Molecular Biology (M)

Ovarian cancer is the most lethal gynecological cancer. While there is an initial high response rate to chemotherapy, over 80% of women diagnosed with advanced disease relapse within 24 months, presenting an urgent need to better understand the molecular mechanisms permitting relapse. Current research suggests that recurrence can be attributed to a subpopulation of cancer stem-like tumor-initiating cells (TICs). Our lab previously demonstrated an essential role of alternative NF-kB signaling in maintaining chemoresistant TICs in ovarian cancer. In addition, recent studies by our lab discovered alternative NF-kB activation occurs through the multifunctional cytokine, TNF-like weak inducer of apoptosis (TWEAK), which was elevated in the ovarian tumor microenvironment (TME) following chemotherapy. However, the cellular source of soluble TWEAK in the ovarian TME is not known. Studies indicate that different stromal cells, including macrophages, secrete soluble TWEAK in the TME and this may be enhanced following chemotherapy. Given both the abundance of macrophages and enrichment of TWEAK throughout the ovarian TME, we are investigating the macrophage-dependent secretion of TWEAK to induce alternative NF-kB activation in ovarian TICs, thereby supporting drug resistance and cancer recurrence. It is unclear which of the two macrophage phenotypes, the anti-tumor M1 or the pro-tumor M2, are responsible for TWEAK production. To represent distinct macrophage populations in vitro, our experiments include the THP-1 monocytic cell line to obtain naïve M0 macrophages and M1- and M2-polarized macrophages. We found that M1 macrophages were less sensitive to chemotherapy treatment relative to M0 and M2 macrophage populations. Moreover, flow cytometry analysis revealed a significant enrichment of M1 markers in the M2-polarized macrophage population following chemotherapy, suggesting chemotherapy may enrich for the M1 phenotype. We further found that macrophages expressing the M1 marker had higher expression of the gene encoding TWEAK. Altogether these findings suggest the M1 phenotype is associated with TWEAK production. Indirect cocultures of ovarian cancer cells and macrophage populations will be used to determine whether cancer cells play a role in TWEAK expression and secretion. Alternative NF-kB activation and expression of stemness genes including SOX2, OCT4 and NANOG will also be measured from ovarian cancer cells following coculture conditions.

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158 11:20 am

SOX2 and OCT4 Activity Identify CSC Populations in Ovarian Cancer

Luisjesus Cruz, Cell and Molecular Biology (D)

Ovarian Cancer is the most lethal gynecological cancer due to late-stage diagnosis and prevalence of chemotherapy-resistant disease. Tumors are comprised of heterogenous cancer cells, which makes targeted therapies challenging. Studies have identified a subset of cancer stem-like cells (CSCs) that, unlike bulk tumor cells, can evade chemotherapy and induce relapse. Surface markers such as CD133, CD44, CD117, or ALDH enzyme activity are typically used to identify and isolate CSCs; however, these markers are inconsistent across cell lines and patient samples making them unreliable for isolating CSCs. Consistent indicators of CSCs may be activity of stem cell transcription factors, such as SOX2, OCT4, and NANOG, which promote long-term self-renewal and asymmetric division, processes required for tumor repopulation. We hypothesize that a reporter responding to SOX2 and OCT4 activity will represent a functional and reliable marker for identifying CSCs capable of enabling relapse. We stably transduced a reporter (SORE6), which detects SOX2 and OCT4 activity, into OV90 and ACI23 ovarian cancer cells. SORE6+ cells, isolated using FACS, have 2 to 15-fold increases in SOX2/OCT4/NANOG transcripts, relative to SORE6- cells. Comparison of chemotherapy versus vehicle conditions suggests that SORE6 more consistently identifies the CSC population. In ACI23 cells, flow cytometry showed a 2-fold increase in SORE6+ cells, 7-fold increase in CD117+ cells, and a 1.2-fold increase in CD133 cells in chemotherapy treated cells relative to vehicle. For OV90, SORE6+ increases again by 2-fold, while CD117+ increases by 5-fold and CD133 increases by 1.5-fold. SORE6+ cells also significantly increased spheroid formation in low serum conditions and resistance to chemotherapy, relative to SORE6- cells. Finally, limiting dilution mouse studies showed a significant increase in tumorigenicity of SORE6+ cells at low dilutions in ACI23 cells. In disassociated tumors, pure SORE6- tumors remained SORE6-, while pure SORE6+ tumors maintained only 10% SORE6+, indicating the ability of SORE6+ cells to asymmetrically divide creating a heterogeneous tumor. In conclusion, these data suggest that the SORE6 reporter identifies a CSC population and could be a useful tool for consistent isolation of CSCs. More reliable identification of CSCs will enable the design of therapies to overcome chemotherapy resistance and disease recurrence.

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159 11:35 am

The role of chemotherapy-induced fibrosis in the maintenance of tumor initiating cells

Omar Lujano Olazaba, Cell and Molecular Biology (D)

Around 80 percent of high-grade serous ovarian cancer patients will relapse with chemotherapy resistant disease. Despite extensive research and developments in immunotherapy, there are limited improvements in overall survival for these patients. Recent research has found that the tumor microenvironment (TME) plays a crucial role in tumor initiation, therapy resistance, and tumor relapse. The TME, which consists of immune cells, blood vessels, and an extracellular matrix (ECM) built primarily by fibroblasts, may enhance the survival and growth of tumor-initiating cells (TICs), chemoresistant stem-like cells thought to be responsible for tumor relapse. Cytotoxic chemotherapies have been shown to modify the TME and this modulation may favor the survival of TICs. For example, carboplatin can activate stromal cells such as fibroblasts to secrete an altered ECM profile, including increases in collagen 1a1 and fibronectin production, which can bind specific integrins upregulated in TICs. Using ex-vivo decellularized peritoneum tissues from mice exposed to chemotherapy or vehicle treatment, we observed a 2-fold increase in growth in peritoneums pre-exposed to chemotherapy relative to those pre-exposed to vehicle. We hypothesize that alterations in the ECM following chemotherapy treatment permit TIC adhesion and growth. To investigate this, mouse embryonic fibroblasts (3T3s) were exposed to chemotherapy during ECM production, decellularized, and reseeded with a panel of ovarian cancer cell lines. Our results suggest a significant increase in cell survival in matrices pre-exposed to chemotherapy compared to control matrices pre-exposed to vehicle. Using this model, we are examining the features of cells that preferentially survive on these matrices. In addition to drug resistance, we are using flow cytometry to assess TIC markers, such as CD117, and CD133, and qRT-PCR to measure stemness genes such as SOX2, OCT4, and NANOG. These studies highlight the need for further investigation into the systemic effects of chemotherapies

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on the TME and how these changes may be fostering cancer cell adhesion, growth, and survival. Understanding these mechanisms will allow us to develop therapies to achieve better clinical outcomes.

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160 11:50 am

Establishing R132Q IDH1 sensitivity to reducing agents

Nalani Coleman, Chemistry - Emphasis in Biochemistry (U)

Isocitrate dehydrogenase 1 (IDH1) is a cytosolic enzyme responsible for the NADP+-dependent oxidative decarboxylation of isocitrate to form ˈ -ketoglutarate (ˈKG),NADPH, and carbon dioxide. Mutations in IDH1 most commonly affect residue 132 and drive a number of cancers including lower grade gliomas, secondary glioblastomas, and chondrosarcomas. When mutated, IDH1 gains a neomorphic catalytic reaction converting ˈKG and cofactor NADPH into oncometabolite D-2-hydroxyglutarate (D2HG) and NADP+. Our lab previously showed that R132Q IDH1 generated the highest levels of D2HG among the IDH1 mutants tested, and maintained some ability to convert isocitrate into ˈKG. Because of these unique characteristics, we sought to obtain a crystal structure of R132Q bound to substrates isocitrate and NADP+ under reducing conditions to mimic the cellular environment. The crystal structure of IDH1 R132Q with substrates bound was successfully solved, but the reducing agent, TCEP, formed an adduct with NADP+. The consequences on the catalytic activity of R132Q when TCEP is adducted to NADP+ is unknown. We hypothesize that the NADP+-dependent normal reaction will be inhibited because of the unavailability of the NADP+ substrate. We performed steady-state kinetic assays on R132Q while varying the concentration of reducing agents to see if the TCEP-NADP+ adduct affects the catalytic activity of R132Q. By elucidating the effects of reducing agent adduct formation, we can better understand the mechanistic consequences to the normal IDH1 reaction and if there are any reducing agent concentration precautions researchers should take when crystallizing IDH1 in future experiments.

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161 12:05 pm

VAX014, a novel oncolytic immunotherapy for bladder cancer, may aid in overcoming tumor immune escape via Type I IFN-mediated upregulation of PD-L1 and MHC-I

Kinsey Nelson, Biology (M)

Bladder cancer is the 4th most diagnosed cancer but therapies are limited in efficacy due to immune evasion by tumors. Two immune evasion mechanisms are downregulation of MHC-I antigen presenting molecules and overexpression of the T cell immune checkpoint molecule, PD-L1. Therapies blocking PD-L1 are available, but variable PD-L1 expression in patients limits their versatility. Treatments that can overcome both PD-L1- and MHC-I-facilitated tumor immune evasion in broad patient populations are needed. VAX014, a novel bacterial minicell-based oncolytic immunotherapy, enhances survival in two mouse models of bladder cancer, MB49 and MBT-2. Previous studies showed MBT-2 tumors express high PD-L1 in situ irrespective of VAX014 treatment. In contrast, MB49 tumors express minimal PD-L1 until treated with VAX014. Here, we examine factors contributing to the upregulation of PD-L1 in MB49 cells in response to VAX014 in vitro. Additionally, we evaluate expression of MHC-I in both MB49 and MBT-2 cells in response to treatment with VAX014. When we cultured MB49 cells +/- VAX014 and evaluated PD-L1 and MHC-I expression via flow cytometry, a near 15- and 5-fold increase in PD-L1 and MHC-I expression was observed, respectively. To determine if soluble factors mediated upregulation, supernatants from MB49 +/- VAX014 treatment were transferred to naïve MB49 cells. When cultured with treated supernatant, these cells upregulated PD-L1 and MHC-I 5- and 3- fold, respectively; showing soluble factors were present. Similar studies using MBT-2 revealed they didn't produce this factor but responded to it after coincubation with VAX014-treated MB49 supernatants by upregulating PD-L1 and MHC-I. Given the known role of Type I Interferons (IFNs) in upregulating MHC-I and PD-L1, we blocked IFN alpha receptor 1 in naïve MB49 and MBT-2 cells prior to supernatant treatment and found that upregulation was lost, suggesting Type I IFNs contribute to upregulation of both PD-L1 and MHC-I in response to VAX014. While the mechanism(s) behind VAX014-mediated Type I IFN production will be the focus of future studies, these results indicate VAX014 activates key anti-tumor immune pathways but paradoxically upregulates PD-L1, suggesting combination with PD-L1 inhibitors in bladder cancer patients may synergize to overcome tumor immune evasion and provide better outcomes.

Session B-4

Oral Humanities, History, Literature, Philosophy 2
Friday, March 4, 2022, 11:00 am
Location: Metzli

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162 11:05 am

"All the world's a stage": Victoria's Media Performance and the Birth of the Royal Family Brand

Taryn Duffy, History (M)

By the nineteenth century, the British monarchy evolved into a political figurehead but preserved its unmatched popular influence over British life. How was this achieved? The answer lies with Queen Victoria, who made herself the first mass-media monarch. Victoria and the media worked alongside one another to craft what is now known as the Royal Family Brand. No longer were the royals separate from the people. Beginning under Victoria, the Royal Family is meant to be seen as the pinnacle of respectability and family togetherness. Today, the monarchy serves as a model for its citizens to look to and learn from, or so the brand supposes. It is because of Queen Victoria that people today are so keen to know every little detail about the Royals and the media scrambles for every glimpse inside Buckingham Palace. Her reign connected the monarchy to the people, creating a more modern function for an ancient institution.

My research will examine how Queen Victoria in tandem with Britain's growing mid- century print culture, created the Royal Family Brand as simultaneously domestic and majestic shaping a new public role for the monarchy. Throughout this research, I will examine the magazine Figaro in London regarding their views on Queen Victoria and, through it trace how Victoria molded her public image. I argue that Victoria created a Royal Brand and her legacy of being in the spotlight lives on today.

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163 11:20 am

Exceeding Singular Identity Narratives of Queer and Disabled Representations in Romantic Films

Nicholas Villarreal, Women Studies (M)

After decades where LGBTQIA+ and disabled identities and characters were either nonexistent in Hollywood films, or they only played the villains, representation is improving but still has a long way to go. Through a close feminist cultural studies reading of the Hollywood romantic films – Call Me By Your Name (2017), and Five Feet Apart (2019) – I will be investigating how the main characters of these romance films, while they are marginalized in one form or another by being queer or disabled, they are simplistic or limited in their representation. I call these "singular identity narratives," not in the sense that these characters are not intersectional but rather that they typically only inhabit one dimensional representations of marginality. I will be exploring how the usage of singular identity narratives (SIN) leads to representation that actually exceeds the attempts to hold only one marginalized identity. These moments of exception often emerge by having specific moments in which the story or character queers disability or they crip/disable queerness. I argue that this is because these narrative spaces, even though they are fictively created, are still too exclusionary to hold multiply marginalized bodies/characters. Furthermore, no person or representation is ever perfectly heterosexual or non-disabled all the time and there are moments when these performances exceed their singular identity narratives. These moments that the representation undermines this logic of absolute normalcy of the other identities held by the characters, are important to understanding the construction of these categories and that this representation of queerness and disability is limited but refuses to be contained. I argue that while these tactics and ideologies are deployed in films to prevent solidarity between LGBTQIA+ and Disabled communities, I also see them as sites of possibilities for coalition between the groups, and that representations that include both identities intentionally, work towards more equality and justice.

164 11:35 am

African American Women and Progressive Reform: Examining Social Action and Mental Health

Emily Windham, History (M)

The pathologizing of women's behavior in Western society dates back thousands of years to ideas of "hysteria" in ancient Greece, derived from the word for "uterus." A modern movement within the mental health field insists upon more culturally informed treatment which sees women's mental health as a result of their circumstances, and takes into account the strengths of communities traditionally excluded from mainstream psychiatric research. Specifically, studies show black women in the United States seek out therapy in smaller numbers than do white women due to a stigma against traditional medicine as well as a propensity for community-based resources like familial networks and religion, which can be linked to the historical abuse of black women on the part of the medical field in the U.S. Feminist and social justice therapy increasingly aims to address societal causes of mental health challenges, and I became interested in the historical precedents of successful autonomous resources among women of color. In order to explore such questions, I analyzed documents from Progressive-era reform associations of African American women. Black women accomplished impressive organization and change as part of this movement, and historians have studied the importance of their work both to this country and to the identity of the women participating. My research specifically focused on published speeches, literature and meeting minutes of a number of organizations including the National Association for Colored Women from women like Mary Church Terrell and Fannie Barrier Williams. The analysis utilized theories of embodiment, intersectionality, and cultural coalescence to understand these associations as not only important resources for concrete improvements in their communities but also as nontraditional forms of mental health support for those women rejected by dominant society. I aimed to study the emotional efforts and accomplishments of women as equally significant to material progress that is more commonly seen as historically significant. When examining the emotional language within these sources one can see the healing effects of communal work, which provided opportunities to build meaningful connections, share stories and experiences, and reassert self-worth for the women involved.

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165 11:50 am

Meditation and PTSD

mariah monreal, Philosophy (U)

The objective of this paper is to research the potential effectiveness of mindful meditation to alleviate symptoms of PTSD. For the purpose of this paper, meditation will be defined as a form of mental training meant to improve an individual's psychological capacities, such as attention and emotional self-regulation. While meditation encompasses many different complex practices, we will be focusing on mindfulness meditation, which is best described as nonjudgmental attention to present-moment experiences. PTSD is defined in this paper as the dysregulation of the reflexive nervous phenomenon, known as fight or flight. While this reflexive nervous phenomenon has obvious survival advantages, evolutionarily the chronic dysregulation of this system leads to functional impairment better known as post-traumatic stress disorder. The focus of this paper is to show that the usefulness of mindful meditation can help alleviate the symptoms of PTSD.

(U) = Undergraduate; (M) = Masters; (D) = Doctoral

166 12:05 pm

The Conundrum of Child Upbringing

Mariel Valle, Philosophy (M)

Children can recognize delusion, and they can confront the unexpected, including delusion itself, with resilience. In this presentation, I explore Buddhism and other cultures in the context of neuroscience and clarify the conundrum of child upbringing to help children recognize delusion. I highlight methods in other cultures that confirm Buddhist approaches. I also discuss the importance of adopting these methods in child upbringing and the extent to which they can help children develop resilience and equanimity.

Session B-5

Oral Engineering and Computer Science 2
Friday, March 4, 2022, 11:00 am
Location: Templo Mayor

167 11:05 am

New Insights into Optimized Design and Surface Characterization of Neural Probes for In-vivo Detection of the Neurotransmitters Dopamine and Serotonin

Daniela Saldana, Bioengineering (M)

Neurotransmitters are signaling molecules which are essential for complex neural system functions. The detection of the neurotransmitters in the brain can provide key insights for neuroscience and clinical research. The ability to detect and quantify key neurotransmitters can inform the detection and the treatment of neurological disorders.

This research aims to describe the methods and techniques used to design, fabricate, and test neural probes for the detection of serotonin and dopamine - two key neurotransmitters. Design of the probes includes material selection, considerations for implantation of probe, considerations for fabrication, location of electrodes on probe for optimal detection, and use-ability of the probe. Fabrication of the probes utilize standard nanofabrication processes such as positive and negative lithography, metal lift-off, and pyrolysis. In vitro testing is performed on the probes in-house with potential for in vivo testing at a partner laboratory. In vitro testing of the probes for functionality and sensitivity includes Electrochemical Impedance Spectroscopy (EIS) and Fast-Scan Cyclic Voltammetry (FSCV).

Material selection is a key component of the design of the probes as mentioned above. The research which will be presented focuses on the use of two materials, glassy carbon and graphene, which have favorable properties for the detection of dopamine and serotonin. Due to the mechanical and electrochemical properties of glassy carbon and graphene, such as their inertness, long term electrical and electrochemical stability and versatility, they are ideal materials for neural probe electrodes.

The outcome of this research aims to optimize the design for an implantable neural probe which can simultaneously detect dopamine and serotonin with high sensitivity.

168 11:20 am

Can Low Detection Limits in Neurotransmitter Detection Be Achieved in Graphene and Glassy Carbon Neural Probes Through Microfabrication Process Optimization?

Lucía Carballo Chanfón, Bioengineering (M)

Neurotransmitters are signaling molecules which are essential for complex neural system functions. The detection of the neurotransmitters in the brain using neural probes can provide key insights for neuroscience and clinical research. The ability to electrochemically detect and quantify key neurotransmitters can also inform the detection and treatment of neurological disorders.

Material selection is a key component of the design of the probes as mentioned above. This research focuses on the use of two materials, glassy carbon and graphene, which have favorable properties for the detection of neurotransmitters. Due to the mechanical and electrochemical properties of glassy carbon and graphene, such as their inertness, long term electrical and electrochemical stability, they are ideal materials for neural probe electrodes.

Various methods and techniques were used to design, fabricate, and test neural probes for the detection of serotonin and dopamine - two key electroactive neurotransmitters. Design of the probes included material selection, considerations for implantation of probe, considerations for fabrication, location of electrodes on probe for optimal detection, and usability of the probe. Fabrication of the probes utilized standard nanofabrication processes such as photolithography, metal lift-off, and pyrolysis. In vitro testing of the probes is performed for functionality and sensitivity, encompassing Electrochemical Impedance Spectroscopy (EIS) and Fast-Scan Cyclic Voltammetry (FSCV). By optimizing the time-temperature curve of the pyrolysis process that forms glassy carbon during fabrication, we hope to gain some insight into how dopamine and serotonin detection sensitivity is altered with pyrolysis time, with the expected results yielding higher sensitivity and in turn, more effective and specialized carbon-based neural probes.

169 11:35 am

BCI (Brain Computer Interface) Meets Biology: What Does Biology Tell us About Expected Neuroplasticity in Patients With BCI Implants

Megan Ryder, Kinesiology (U)

The symbiotic interaction between an individual's brain and an artificial intelligence system is often defined as the term 'Brain Computer Interface'. The process of establishing a symbiotic relationship potentially employs intelligent systems to interpret the electrical activity performed by the brain in the form of neuronal action potentials thereby producing output commands. The brain then makes a confrontational change in its physiology by receiving feedback from the outputs generated, commonly known as 'Neuroplasticity'. The symbiotic and cyclical nature of the brain-artificial intelligence interaction is more often than never facilitated by the plastic nature of our human brains. The research presented will outline the neurophysiology behind synaptic plasticity and apply this knowledge towards the novel concept of BCI integration in a comprehensive literature review. The contents of this paper will analyze how BCIs can influence synaptic plasticity, and how this affects subjects currently implanted with neural probes through analysis of clinical trials. The outcome is to assess to what extent synaptic plasticity can effectively be influenced via neuromodulation, and how implantable BCIs may affect the livelihood and functioning of the subjects that possess them thereby determining the potential of turning them from a necessity to an accessory.

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170 11:50 am

Predicting phenotype to mechanotype relationship in cells based on intra-cellular signaling networks

Esra Tiftik, Bioengineering (D)

Cells from different tissues in the body respond differently to almost the same external stimuli. For example, cardiac cells contract in response to stress hormone signaling while smooth muscles cells in the airways relax. Even for cells originating from the same tissue, these responses can vary significantly. For example, normal breast epithelial cells do not respond to stress hormone signaling in any discernible manner. However, highly metastatic breast epithelial cancer cells respond to the same external signals by increasing contractility and migration. Differences in cellular responses to a variety of other external signals such as matrix stiffness, cell-cell adhesion and even drug response have been well documented in literature. While an argument can be made that these responses are dependent on the cell phenotype, one can still not accurately predict the outcome of a particular signal even if the gene expression profile of a cell is known. We have developed a semi-quantitative-computational model to analyze the intra-cellular signaling network and its outcome in the presence of multiple external signals including growth factors, hormones, and extracellular matrix . We use this model to analyze the cell response phase space to external stimuli and identify the key internal elements of the network that drive specific outcomes within this phase space. The model is built upon Boolean approach to network modeling, where the state of any given node is determined using the state of the connecting nodes and boolean logic. This allows us to analyze the network behavior without the need to estimate all the various interaction rates between different cellular components. However, such an approach is limited in its ability to predict network dynamics and temporal evolution of the cell state. So we introduce dynamical aspects using modified hill functions for signal transmission rates within the network as well as machine learning models trained on kinetic data. Combining these three approaches, we provide a unique computational model to predict the response of cells in different phenotypic states to external signaling. We are using this model to understand the disparities in stress hormone and extracellular matrix signaling response seen in breast cancer cells.

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171 12:05 pm

Modeling Cellular Adhesion Strength

Clemence Rausa, Mechanical Engineering with Emphasis in Bioengineering (U)

The structure and function of cells go hand in hand. Differing cancer cell strains each hold unique biological properties which consequently influence their mechanics. These differences in mechanics have been proposed as markers for metastatic potential and cancer prognosis. For example, weak adhesion in cancer cells is a sign of increased metastatic potential and poor outcomes in cancer patients. In order to measure the adhesive strength of various cancers, we apply increasing shear stress to cells seeded on a surface and measure the percentage of cells detaching from the surface at each shear stress. However, the biochemical and biomechanical cellular components that contribute to a cell's adhesion strength are not well understood. The aim is to replicate cell adhesion strength measurements through cell-scale simulation models in MATLAB. These simulations employ the relevant properties and dynamics of cells in order to accurately reproduce physical findings. Using these models, we determine which cellular components are relevant to a cell's adhesion strength. Dynamics of cellular stress fibers are modeled in detail; including their extension, recruitment at cell-surface adhesion, consequent breaking of these adhesions, and their retraction. Our preliminary results indicate that myosin activity, which generates forces in cell stress-fibers, plays a significant role in modulating cancer cell adhesion strength and might be the root cause of differences in adhesions between highly metastatic and non-metastatic cells. This also suggests that drugs that target actin-myosin contractility can be used to tune cell adhesion strengths and lower a cancer cell's metastatic potential.

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172 12:20 pm

Topic Modeling and Network Visualization to Explore Global Health Disparities

Nermeeta Dhillon, Bioinformatics and Medical Informatics (M)

The Affordable Care Act(ACA), a monumental piece of legislation provided a much needed thrust addressing disparities in access to healthcare. This included an increase in funding geared towards public health and health disparities research and has driven a massive surge in the number of publications addressing various topics within this research space. A basic PubMed search for health disparities outputs over 100,000 publications within just the past decade. While this increased research in the field is desirable, there is a lack of collaboration between biomedical and biotechnological researchers and health disparity researchers. This disconnect makes the development and deployment of novel interventions, remediation strategies and technologies to address the most relevant and critical issues difficult as the field is continuously and rapidly evolving. We aim to bridge this widening gap between the two fields by creating the first contextually based topic model network visualization to represent the research performed in the field of health disparities and biomedical technologies. This network visualization highlights the topics of current importance. PubMed maintains an extensive database for biomedical and life sciences literature. Scientific article abstracts from the past 10 years containing key words and mesh words associated with health disparities and biomedical technologies were scraped. These abstracts were further analyzed using an adapted version of a Natural Language Processing pipeline with the Spacy tokenizer, BERT sentence transformer algorithm, unsupervised clustering and TF-IDF for topic modeling. Our initial results, focus on San Diego based research initiatives on addressing human health disparities, highlights strong research connections between Latino immigrants and cardiovascular disease, tobacco use and adolescent pregnancy, and between African American populations, HIV, and premature births. These preliminary results can provide target areas for biomedical and biotechnology researchers to target key public health issues facing San Diego County residents.

Session B-6

Oral Physical and Mathematical Sciences 2
Friday, March 4, 2022, 11:00 am
Location: Visionary Suite

173 11:05 am

“Uninhabitable” Worlds in the Galaxy

Vladimir Bautista, Astronomy (U)

To date, we have discovered thousands of exoplanets, most of which orbit a single star. Interestingly, some of these exist in the "habitable zone", the region around a star that would allow liquid water to exist on the surface of a rocky planet. The location of the habitable zone depends on the temperature of the star. Low-mass stars are generally cool stars and so the habitable zone is close to the star (for high-mass stars, the habitable zone needs to be farther out). Some planets orbit two stars, which is not surprising because about half of the stars in the sky are in binary pairs. A planet that orbits a binary star is called a "circumbinary planet". However, for binary stars, there is a limit called the “critical instability radius” that dictates how close the planet can be from the stars. Any planet inside this “radius” cannot maintain stability in its orbit and will get thrown out of the system. If this critical instability radius is larger than the habitable zone, it is not possible for a planet to be in the habitable zone. Therefore, some types of binary stars simply cannot have any habitable zone planets. We explore the conditions that create such "uninhabitable" zones: stellar masses, mass ratios, temperatures, radii, orbital periods, and eccentricities.

174 11:20 am

Classifying Viral Capsids

Colin Brown, Physics (M)

In discovering and analyzing novel viruses and virus-like particles, methods for categorizing and classifying them are essential. One of the ways to classify viruses is by the structure of the protein shell that encloses their genetic material known as a capsid. A large subset of capsids, those with icosahedral symmetry, are currently classified using a geometric theory that assigns a Triangulation(T)-number. This T-number can serve as a predictor for a capsid’s size and stoichiometry. However, there exists no agreed-upon systematic manner of assigning a T-number. Classification typically occurs by visual inspection of the complete capsid and by the capsid’s stoichiometry. The T-number alone can also be ambiguous; it provides no information about a capsid’s physical properties. We present a classification scheme based on identifying a capsid’s rigid mechanical subunits and the positions of these subunits within a complete capsid. We expect this approach to help resolve ambiguities in the geometrical theory of viral capsids, augment existing classifications with information about capsids’ physical properties, and reveal cases where existing geometric theories fail or are ambiguous. To identify the rigid subunits of a viral capsid, we apply “Domain Decomposition” methods to atomic models of viral capsids using a custom tool written in python and run on the SDSU CINCI Supercomputing Cluster. After identifying these subunits, we compare them to the subunit layout predicted by the geometric theories, allowing us to assign a classification. We test this method by applying it to a set of capsids that use the HK97 protein fold, a fold known to form complex capsid geometries of many different sizes. We obtain Protein Data Bank(PDB) files containing atomic models of these capsids from the RCSB website. We identify and classify capsids whose T-numbers range from T=1 to T=13 and adopt several geometric layouts derived from Archimedean Lattices. The software tool used to identify the rigid subunits and preliminary results have already been published in a public Github repository.

175 11:35 am

Quantifying entropy values for pregnant women’s activity patterns during their gestational period to dictate a good versus bad pregnancy

Sashiel Vagus, Applied Mathematics Dynamical Systems (M)

Recent studies suggest there is a link between activity patterns in pregnant women and their maternal-fetal health. They also suggest that irregular activity patterns can negatively affect metabolic and hormonal physiology. This is important to consider since irregular activity patterns could potentially lead to disease. However, not much is known about how this may affect pregnant women. Therefore in this study, a large group of pregnant women had their activity patterns monitored by having them wear a wrist actigraphy device that would measure their activity during week 22, and week 32 of their gestation periods, and a week post pregnancy. The results from this study were analyzed using Topology which is commonly used as a way to study the shape of data. This type of analysis allows the data to be studied through persistence homology. After applying the vietoris-rips complex filtration to obtain persistence diagrams, the bottleneck distances of each were computed to find similarities between the women. Along with that, the entropies of each persistence diagram set were quantified. This was done with the intention to find what level of entropy would lead to a good or bad pregnancy. Results showed that bad pregnancies,

pregnancies in which the newborns are born with ill health, usually have an entropy value of over 6.6. Findings may support the idea that there is a link between activity rhythms at early pregnancy and the disruption of the circadian system that lead to certain health outcomes for the mother and fetus. This is crucial to look into, since more can be learned about how to avoid certain activity patterns that lead to negative outcomes. Especially when it comes to women who may be economically disadvantaged and need to work more.

176 11:50 am

Optimization of Alternative Solvents for the Labelling of Amino Acids on Extraterrestrial Bodies

Jessica Torres, Chemistry (D)

As many scientific advances are being made furthering space exploration, Mars and ocean world moons such as Europa and Enceladus are a prime target in our exploration of potentially habitable worlds. These planetary bodies may harbor evidence of past microorganisms that have survived oligotrophic environments. While past extraterrestrial life may exist amongst these planetary bodies, it is unknown which form "life" will take. To increase the possibility of detecting life, we plan to detect past life at a molecular level on planetary rocks. Biosignatures such as amino acids are found in all three kingdoms of life on Earth and are the target for future space exploration missions.

Capillary electrophoresis coupled to laser induced fluorescence (CE-LIF) is an analytical method that has become a widely used and effective tool for the analysis of biologically important samples in fields of biochemistry and astrobiology. This process can achieve sub-part-per-billion limits of detection, with low sample volume and consumption. While CE-LIF is an effective tool to be used towards space exploration, there are some limitations due to the sample matrix. Solvents that are organic and low volatility are not deemed long-term stable for space exploration. For this reason, deep eutectic solvents are of particular interest for the sampling of amino acids. Deep eutectic solvents (DES) are non-aqueous organic solvents that are a binary, low-volatility, and thermally stable mixtures, akin to ionic liquids. I am currently investigating DES as a non-aqueous labelling media for amino acid quantification for future application on the identification of extra-terrestrial life on planetary rocks.

This work will present the method development process and reaction optimization for the detection of amino acids. Specifically, a series of biologically important amino acids were fluorescently labeled using a DES based reaction where the reaction is validated via CE-LIF separations.

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177 12:05 pm

Dynamics of the climax and attack communities in cystic fibrosis

Peter Uhl, Computational Science (D)

Lung infections are one of the most severe health concerns and the leading cause of death for cystic fibrosis (CF) patients. Cystic fibrosis is caused by a genetic mutation that inhibits ion transport across cell membranes, resulting in dehydrated mucus in the lung airways. The dehydrated mucus is highly viscous, promoting the colonization of a pathogenic microbial community, which persists throughout the lifetime of CF patients. The composition of the microbial community is critical for CF patients' health and treatment decisions. In this study, we develop novel mathematical models of two bacterial communities, the aerobic climax community and anaerobic attack community, in the lungs of CF patients and evaluate the role of oxygen availability to alter the composition of the bacterial communities. We implemented two approaches: an ordinary differential equation-based model to gain basic insights into the community dynamics, and agent-based models to explore the impact of spatial heterogeneity. Our models are consistent with the data from a patient undergoing interrupted treatment for a CF-caused lung infection. We analyzed our models to determine conditions that minimize the pathogenic attack community with attack-specific antibiotics and increased oxygen concentration. We also investigated how the spatially dependent oxygen affects the community dynamics. Our results suggest that oxygen availability and structured antibiotic use can play a critical role in maintaining a low level of attack community associated with CF patients' severe health conditions.

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178 12:20 pm

Biomedical Application of Peptide Stapling

Joseph Hatton, Chemistry - Biochemistry (U)

Peptides'α-helix are understood to have therapeutic value in medicinal chemistry but are difficult to apply due to the fact they become unstable during their protein-protein interactions of interest. An effective solution addressing this issue is chemical stapling, where two amino acids on a peptide are joined together by a covalent bond which in turn provides strength and structure, stabilizing the ˈ-helix and limiting potential conformations. Specifically, ring closing metathesis is a method of chemical stapling that is uniquely of interest to us. This metathesis reaction happens when two alkenes on the ˈ-helix connect and a closed ring is created in the process. Stapling peptides is of main interest to us due to their influence in drug discovery research, particularly with our peptide: EDIIRNIARHLAWVGDWMDRSI playing part in the BID/BCL-2 protein-protein interaction which induces apoptosis in Leukemia cells. Apoptosis is when dangerously mutated cells such as cancer cells kill themselves off in a systematic fashion. Putting this together, we want to target the BID-BCL-2 protein-protein interaction to potentially induce apoptosis in Leukemia patients, but without chemically stapling its ˈ-helix it would become too unstable in the process. With our understanding of how effective RCM is in stabilizing peptides and the anticarcinogenic properties of our specific peptide of interest we plan to staple the peptide in an attempt to verify that our method of chemical stapling is as efficient or better than methods already in use. In the end we will take a 3D NMR scan of our stapled peptide which will verify the staple has worked and biomedical testing could occur to see how effective it is with treating Leukemia.

Session B-7

Oral Creative Arts and Design / Visual or Performing Arts 2

Friday, March 4, 2022, 11:00 am

Location: Legacy Suite

179 11:05 am

Dearest All, So you don't like Minneapolis, I'm so sorry. Goodbye

Jill Holslin, Master's Degree in Fine Arts (M)

This project uses art and writing to engage with the material culture and artifacts of white European immigration, interrogating the history of whiteness and the erasure of indigenous history and knowledge in the US from a critical position of decoloniality. The immigration of white Europeans to the US was based on a logic of genocide and forgetting that continues to this day, a logic that is produced and reproduced in material culture. In my work, I am addressing this topic by using print practices, book arts, photographic and image work, and fiction to appropriate and recreate a series of found antique postcards from the US Midwest dating between 1907-1920, the "golden age of postcards." My process is to appropriate old postcards and recreate new fictional postcards with my own printed images and new messages that incorporate Native American knowledge, place names, and stories. I use a combination of new postcards with original, archival pieces to confront and make visible the production of a "white landscape" and the erasure histories of displacement and violence against Native Americans. This historical moment marks the high point of European immigration to the US. The postcard represents an exchange of cultural codes that produces landscape, history and belonging. The sender of a postcard establishes an imaginary relationship between herself, the space, and the recipient of a postcard. I argue that one way whiteness was produced is through the circulation of postcards by white European immigrants that create a sense of place that simultaneously made Native American life, knowledge and existence invisible. My own recreation of new postcards is a way of making the production of landscape and history visible and intervening in it. In this way, I will speak back to the past from my own contemporary moment to recontextualize the Minnesotan landscape.

180 11:20 am

Sports Cards Are Messages: Textual Analysis of a Sports Card

Thomas Christensen, Mass Communication and Media Studies (M)

Sports cards are photographs with symbols, printed out for mass distribution on a global scale. Demand for products like these have substantially increased annually, going back several years. Secondary economies have been forged through this steadily increasing demand. What makes each card valuable to each person depends on the photograph used, the symbols throughout the image, the material the card is printed on, and the condition of that material. A single sports card recently sold for $5.2 Million. Why? Why would someone spend millions of dollars on a photograph when they could print one out to the same effect? What is it about these items that draws collectors, fans, and entrepreneurs? There must be meaning within the card. This meaning is likely conveyed through imagery. Sports cards are photographs that convey a narrative of an event and/or a subject. They are distributed on a massive scale, which allows it to be considered mass media or mass communication. Several searches for peer-reviewed articles gave minimal information on sports cards in general. This includes searching for thesis and dissertations. This is a completely underrepresented field of research.

Images are signs, and the communication of signs is semiotics. We attach mythology to signs that weave history and story into the meaning of those images. Being able to attach oneself emotionally to an image fosters meaning through narration. We tell stories and connect to stories from other people through narrative paradigm. Some stories are better than others, which would explain the popularity of certain narratives over other equally great accomplishments. Framing is important. How the image is produced and distributed can change how the consumer views it, or how the narrative is presented. Using textual analysis will allow me to be flexible and apply the three theories mentioned above to provide a foundation for additional research relating to this field. Using a textual analysis and identifying the core of what cards like this represent opens the doors to similar items being examined. Using these theories should provide a good foundation that maps out what a sports card is through the eyes of the audience.

181 11:35 am

Trans Representation in Video Games

JJ Rezaei, criminal justice (U)

There has been a growing amount of minority representation in the video game industry, especially of transgender people. Trans representation has been spearheaded by independent developers, usually trans themselves, putting their own mental health and financial security on the line in order to create “indie” games that are often very meaningful to themselves and their communities. The unprecedented amount of success that followed these indie games gave rise to increased trans representation in mainstream games as well, culminating in games like Dontnod Entertainment’s Tell Me Why, portraying a playable transgender protagonist in its central storyline. Unfortunately, mainstream representation often provides a very limited view of the minority people’s experiences and may not be as beneficial as it might appear to be.

182 11:50 am

Yoko Ono & Fluxus: Blurring Boundaries, Creating Value

Dayne Sakazaki, Music Education (U)

The European tradition of classical music has clearly defined modes of concert performance that govern how composers, performers, and audience members should engage the cultural practice of making music. In the 1960s and 1970s, several countercultural artists challenged these inherited practices by radicalizing performance, including inviting audience members to cut a performer's clothes off, sitting naked atop piles of rubber tires, and performing a musical composition seeming to consist entirely of silence. These rebellious artists, who loosely identified as a group called "Fluxus," included Yoko Ono, of Beatles-breaking fame. She hosted many Fluxus performances in her Manhattan loft throughout the 1960s, and her works—including her anthology of poetic performance instructions called Grapefruit and her scream filled album Plastic Ono Band—are poignant examples of Fluxus artists' revamped perspectives on performance art, composer-performer-audience relations, and the blurred lines between life and art.

Most Fluxus artists were dedicated to the integration of diverse entities, and an examination of a selection of Yoko Ono's work reveals ongoing relevance to today's divided world. Ono's reaction against division was to synthesize: She rebelled against societal boundaries dividing genders, ethnic cultures, and artistic traditions by coalescing her identities as a woman, a descendant and scholar of Japanese traditional art, and an avant-garde musician and performer. Many of her Fluxus compatriots did similar in what they dubbed "intermedia art," laying the foundations for a new paradigm of melding art forms, cultures, and artistic practices. By calling attention to overshadowed and underappreciated activities, the Fluxus legacy reminds us of aspects of the human condition and human behavior that Western society had overlooked for centuries.

Abstracts of Presentations

Session C

San Diego State University

(U) = Undergraduate; (M) = Masters; (D) = Doctoral

Session C-1

Oral Behavioral and Social Sciences 6
Friday, March 4, 2022, 1:00 pm
Location: Pride Suite

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183 1:05 pm

Pupil response and cognitive effort during online sentence processing in aphasia

Christina Sen, Language and Communicative Disorders (D)

Pupillometry is an online eye-tracking method that can be used to measure cognitive/processing effort during language processing. By examining pupillary response while listening to auditorily presented sentences, we can explore how processing effort varies in real-time throughout sentences in language-unimpaired and -impaired populations.

We are interested in measuring processing effort in individuals with aphasia (n=11, IWA; a language disorder secondary to stroke) compared to age-matched controls (n=11, AMC) during the real time processing of complex sentences (lexical and syntactic focus). While prior research demonstrated that IWA are delayed in accessing lexical representations and in creating syntactic links during sentence processing (compared to AMC), they were only able to capture these delays at single points in a sentence. To observe these differences throughout an uninterrupted sentence [1], we measured pupillary responses during an eye-tracking-while-listening visual world paradigm.

[1] The eagle saw the venomous/voracious snake that the bear cautiously encountered

underneath the narrow bridge.

Sentences are presented auditorily while images related to nouns in the sentence are displayed on a screen. We manipulated the semantic biasing of an adjective (venomous/voracious) towards the second noun (snake) to examine if IWA can use semantic information to ease processing effort in accessing snake as well as downstream at the main verb (encountered) which requires complex linking to the direct object (snake).

Results demonstrated a significant Group effect on pupillary responses throughout the whole sentence as well as an adjective-biasXGroup interaction. IWA showed distinctive pupillary response patterns compared to AMC, reflecting differences in overall processing effort. At the adjective-noun time-window, semantic biasing significantly reduced processing effort for both groups. At the main verb, differences emerged between groups with AMC showing increases and IWA showing decreases in processing effort.

These findings reveal that at the lexical level, IWA can access and use semantic information in real-time but during a specific aspect of structure building, they process structure differently than AMC. We believe the impaired processing at the syntactic linking of a verb and its direct object contributes to IWA's comprehension difficulties. This work has implications for theories of sentence processing in aphasia.

184 1:20 pm

New Tasks to Measure Nonverbal Working Memory and Attention in Children

Sophie Levi, Language and Communicative Disorders (D)

Given the adverse consequences that Developmental Language Disorder (DLD) has on children's language ability, and the disproportionate misdiagnosis of DLD in bilingual children, there is a growing need for additional tools to identify DLD across diverse learners. Children with DLD have subtle cognitive processing weaknesses in domains such as attention and working memory. These deficits manifest in poorer performance on nonlinguistic cognitive processing tasks (Pauls & Archibald, 2016; Vugs et al., 2013) in comparison to unaffected peers. The present study investigates the validity of visuospatial, as opposed to auditory, nonlinguistic cognitive processing tasks, with the intention that these tasks be extended to children with DLD across diverse linguistic backgrounds in future work. Data were collected in an urban setting in the northern Midwest, resulting in a sample of 71 monolingual English-speaking children between the ages of 4-10 years old. Participating children did not have any reported developmental disorders that would exclude a diagnosis of DLD or of typical development. Children completed two nonlinguistic cognitive processing tasks in the visual domain to assess working memory and sustained selective attention. Subsequent data analysis considered associations between children's cognitive processing skills, parental report of language ability and language concerns. Children's age was positively related to their performance on the sustained selective attention (r=0.494, p<.001) and working memory tasks (r=0.529, p<.001). Associations exist between parent-reported concern for children's language development, and their performance on the sustained selective attention task (r=-0.307, p=.010), but not for working memory (r=-0.084, p=.487). Between-task relationships were also observed among working memory and sustained selective attention tasks (r=0.288, p=.016). Findings suggest that overall, older children perform better than younger children on the nonlinguistic cognitive processing tasks administered. Likewise, the visuospatial task measuring sustained selective attention may have more potential than the working memory task to identify language disorders in school-age children. Future directions should include children from a range of language backgrounds, with and without DLD diagnosis, with the goal of improving the clinical assessment of DLD in children across diverse linguistic populations.

185 1:35 pm

Telepractice for phonological disorders: Results from a complexity-based intervention

Abigail John, Language and Communicative Disorders (D)

Background

Children with phonological disorder (PD), or difficulties producing speech sounds, often experience concomitant deficits in language and literacy skills, leading to increased challenges in achieving academic, socioeconomic, and literacy success in adolescent and adult years (Lewis et al., 2000a;

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Lewis, et al., 2015). Morphology is a domain of language, accounting for linguistic units that are frequently attached to bare word forms, mark tense and agreement, and inherently bear phonological characteristics (e.g. bare word: ‘dog’ + plural morpheme: ‘-s’ creates the multimorphemic word, ‘dogs’).Therefore, cross-domain interventions that address both morphosyntactic and phonological skills may increase positive outcomes for this population (Combiths et al., 2019). Complexity-based approaches have been shown to be effective across both domains, where linguistically complex targets (i.e two- and three- element consonant clusters in phonology; multi-morphemic words in morphosyntax) are trained to facilitate growth beyond the treated target (Tambyraja & Dunkle, 2014; Van Horne et al., 2017).

Present Study

In the present study, nine children with PD participated in a 6-week telepractice intervention utilizing a complexity-based phonological approach (Gierut, 2007). Detailed assessment of each participant’s existing speech sound system led to selection of an individualized linguistically complex speech sound target: a consonant cluster within either a monomorphemic form (e.g., /-ks/ in “mix”: /mɪks/) or bimorphemic form (e.g., /-ks/ in “packs”: /pæk/ + 3rd-person singular /-s/). Each child received six weeks of intervention, three times per week, with a series of target words that contained their target sound in either a simple (i.e., monomorph) or complex (i.e., bimorph) classification. Post-intervention assessments revealed the efficacy of this complexity-based approach across linguistic domains.

Discussion

The evaluation of the effects of a cross-domain intervention enhances clinical understanding about the nature of carefully selected, linguistically complex treatment targets that may increase overall positive outcomes in children with PD.

186 1:50 pm

A Longitudinal Study of Trauma and the Development of Eating Disorders in Children

Rebecca Mendoza, Psychology (U)

Childhood trauma has been shown to be associated with later eating disorder development in adults. Eating disorders (EDs) in pre-adolescents are often understudied, especially regarding trauma as a potential risk factor for ED development. While previous studies have examined childhood trauma and subsequent EDs in adults cross-sectionally, no studies to our knowledge have assessed the temporal association of childhood trauma and ED onset in child participants. Therefore, the present study aims to examine the temporality of childhood trauma and subsequent ED development in children. Binge-purge subtype disorders (i.e., bulimia nervosa, binge eating disorder, and other specified feeding and eating disorders with binge-purge behaviors) will be used because previous research has indicated that these presentations have the strongest association with trauma history. Data used in the current study was from 11,577 youth participants (aged 9-10 at baseline) enrolled in the Adolescent Brain Cognitive Development (ABCD) study, a nationally representative sample of children. Logistic regression with complex sampling was used to assess the longitudinal relationship of children who had trauma exposure at baseline and met criteria for an ED diagnosis a year later, excluding participants who already met criteria for an ED at baseline. Children who were exposed to trauma prior to baseline had 2.05 times greater odds of being diagnosed with an eating disorder one year later (OR = 2.05; 95% CI: 1.21 - 3.49; p = .01) as compared to those who had not experienced trauma. The current study extends previous cross-sectional research findings to show a significant temporal association between childhood trauma before ages 9-10 and ED development a year later. Future research is needed to show consecutive timepoints in adolescents of ED development after trauma exposure to assess if there is a common time frame between trauma exposure and ED development. Further understanding these findings could help with ED preventions for children exposed to trauma and including trauma informed care for children receiving treatment for ED.

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187 2:05 pm

Prenatal THC and nicotine e-cigarette exposure influences offspring motor coordination and balance

Jenna Wesely, Psychology (M)

Both prenatal exposure to delta-9-tetrahydrocannabinol (THC) found in marijuana products and nicotine found in tobacco products have been linked to adverse behavioral outcomes among the exposed offspring. Electronic cigarettes, or vapes, allow for the combination of varying levels of nicotine and THC to be easily consumed and have become a popular administrative route for these drugs especially among adolescents and young adults. The following study sought to model e-cigarette exposure during pregnancy to determine whether prenatal vaporized inhalation of THC or the combination of THC and nicotine (NIC + THC) affects the offspring’s motor coordination and balance. Pregnant Sprague-Dawley rats were randomly assigned to receive either no vaporized inhalation exposure (NVC) or e-cigarette vaporized inhalation exposure to THC, NIC + THC, or vehicle (VEH). Pregnant dams were each placed into individual vapor inhalation chambers from gestational day 5 to 20, and vaporized THC (200 mg/ml), NIC + THC (36 mg/ml; 200 mg/ml), or VEH (propylene glycol) was delivered in 6-second puffs every 5 minutes over the course of 30 minutes (7 puffs total) each day. One female and one male offspring from each litter were tested using a parallel bar task from postnatal day (PD) 31-33, to measure the offspring’s motor coordination and balance. Preliminary results indicate that THC alone did not affect motor performance, but that the combination of NIC + THC impaired motor function. Specifically, the NIC + THC group required more trials to the first success, had fewer successful trials and were not able to traverse across more difficult bar widths. In fact, none of the subjects exposed to both THC + NIC were able to traverse the bars on the first day of testing. These results suggest that the combination of prenatal THC and nicotine exposure may be particularly damaging to the offspring’s motor coordination and balance. Thus, e-cigarette delivery of THC and nicotine during pregnancy may lead to behavioral alterations in offspring, findings with important implications for public health policy. Supported by TRDRP 28IP-0026.

188 2:20 pm

Evidence for Disproportionate Source Recognition Discriminability Impairment in Huntington's versus Alzheimer's Disease

Emma Churchill, Psychology (M)

Abstract: Research suggests that those with Huntington's disease (HD) outperform individuals with Alzheimer's disease (AD) on the Yes/No Recognition trial of the California Verbal Learning Test (CVLT). However, comparable scores between HD and AD are shown on the Source Recognition Discriminability (RD) index, which examines the ability to discriminate List A targets from List B distractors. This suggests that HD may involve disproportionate impairment in aspects of yes/no recognition that are sensitive to source memory as a result of subcortical-frontal system involvement. Source RD deficits between HD and AD have not been closely examined across stages of dementia severity.

Objective: To investigate whether individuals with HD or AD exhibit comparable deficits on Source RD throughout dementia severity.

Methods: 107 participants (55=HD, 52=AD) characterized as mild or moderate on dementia severity based on the Dementia Rating Scale (DRS) or DRS-2 scores: 120 or above = mild, 100-119 = moderate completed the CVLT. Individuals with HD were recruited from the Huntington's Disease Clinical Research Center at the University of California, San Diego and were administered the Unified Huntington's Disease Rating Scale by a senior neurologist. Individuals with AD were recruited from the Shiley-Marcos Alzheimer's Disease Research Center. Diagnoses were made by a senior neurologist using criteria established by the National Institute of Neurological and Communicative Disorders and Stroke–Alzheimer's Disease and Related Disorders Association workgroups.

Results: An ANOVA test revealed a significant effect of group on scaled scores on the List A vs. List B RD index. Among individuals with mild dementia, performance was significantly better in the HD group versus the AD group. However, performance was not significantly different between the HD and AD groups in those with moderate dementia.

Discussion: Relative to AD, HD may be associated with a disproportionate decline in aspects of yes/no recognition that are sensitive to source memory, resulting in a comparable degree of impairment in the moderate stage of dementia. We hypothesize that worsening performance on List A vs. List B RD with increasing dementia severity in HD reflects a disproportionate impact of subcortical-frontal system pathology, a neural substrate known to be important for source memory.

Session C-2

Oral Behavioral and Social Sciences 7

Friday, March 4, 2022, 1:00 pm

Location: Park Boulevard

189 1:05 pm

BrightSide Produce: Alleviating Food Deserts and Food Insecurity in the SDSU Community

Brooke Chan, Environmental Science (U)

Food deserts and food insecurity pose a risk to the San Diego State University (SDSU) community. Individuals who face these problems seek out fresh produce, but are unable to find and/or afford nutritious fruits and vegetables. To combat both issues, BrightSide Produce works towards a more encompassing solution for SDSU and its community members. BrightSide aims to solve the limited choices of affordable fresh fruits and vegetables on SDSU's campus through sales and donations at the BrightSide produce stand. The produce stand generates public awareness regarding food deserts and food insecurity, providing easy access to fruits, vegetables, and information at a central location. BrightSide also mitigates food waste by working with Wesley House and on-campus composting to achieve a zero food waste operation. With the stand having output a total of 2,052 produce units in nine weeks - 67.3% sold, 24% donated, and 8.7% composted - BrightSide's produce stand has already begun to see progressive results within one semester of its launch. Continued expansion of BrightSide Produce will generate greater awareness within the SDSU community, and communicate knowledge on how to combat food deserts and food insecurity for future generations.

190 1:20 pm

Support of Menstrual Products Provision in Four-Year Universities

Tanya Ortiz, Communication (M)

With recent approval of the "Menstrual Equity for All Act of 2021" in California, there is a unique opportunity to investigate students' levels of support for the provision of menstrual products on campus. Using the Theory of Normative Social Behavior (TNSB), the study quantitatively examines the relationship between the number of menstruators in the participants' family and their support for the provision of menstrual products on campus. An online survey of 210 participants was conducted using Qualtrics, with participants being recruited from the San Diego State University College of Professional and Fine Arts' research pool. Results revealed that a majority of participants agreed with the provision of menstrual products in restrooms, but only a small number support the provision in classrooms and eating areas. A linear regression revealed that there was a positive, but insignificant relationship between the number of menstruators in one's family and their support for the provision of menstrual products in restrooms on campus. These results suggest that there is likely another factor that has a stronger influence on one's support for the provision of menstrual products. These results have implications for how the Equity Act can be implemented at SDSU.

191 1:35 pm

A Qualitative Examination of Women Veteran's Healthcare Seeking Experiences

Monica McGill, Public Health Health Promotion and Behavioral Science (M)

Women are the fastest-growing veteran population but little is known about women's healthcare-seeking experiences after leaving active duty. In particular, there has been minimal research on the experiences of women who do not seek care from the Department of Veterans Affairs (VA) health care system. This exploratory study sought to understand factors that affect women veterans' healthcare-seeking experiences, identify barriers and facilitators of seeking care, and understand how women veterans define high-quality care. Women veterans from across the U.S. were recruited to participate in a mixed-methods pilot study. Data from in-depth telephone interviews conducted as part of the larger study were analyzed here (n=31). Participants were asked about their backgrounds and healthcare-seeking experiences after separating from the military. Interview transcripts were analyzed using applied thematic analysis by two independent coders. The average age of participants was 33 years old (SD= 7.3) and 57.7% were Non-Hispanic White, 11.5% were Hispanic, 19.2% were Black and 11.5% were Asian. Participants, on average, spent 6.7 years (SD=6.1) on active duty with the majority of participants serving in the Army (50%), followed by Navy (23.1%), Air Force (23.1%), and Marine Corps (3.8%). Qualitative analysis of interviews is ongoing but preliminary results revealed several barriers and facilitators encountered by women veterans when seeking healthcare. Challenges included appointment availability, uncertainty of VA benefits, and affordability. Facilitators included short wait times and convenient clinic locations. Preliminary results also indicate system-level factors like affordability and time spent with provider and provider-level factors like general rapport are important to women veterans when defining high quality care. Understanding the healthcare seeking experiences of women veterans after leaving active duty is necessary to ensure women veterans are able to access healthcare either at the VA or elsewhere. These preliminary results indicate areas of healthcare that can be improved to better facilitate women veterans accessing care. Factors at both the system-level and provider-level should also be considered to provide high-quality care to women veterans.

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192 1:50 pm

Exploring Persistent Substance Use Treatment Barriers in California

Caitanya Cook, Social Work (M)

Background: Approved in 2015, the California Drug Medi-Cal Organized Delivery System increased funding, access, and quality of care for Medicaid-eligible individuals with substance use disorders (SUD). This waiver (S.115) covers 95% of the state's population. Still, barriers persist; only 5% of people who need substance use treatment receive it. This study examines providers' perceived barriers to people receiving substance use treatment. We hypothesized that environmental risk factors and organizational characteristics are associated with providers' perception of patients' inability to participate in treatment.

Methods: From October 2021-January 2022, we collected data from 87 participants using online surveys. Data were gathered using convenience sampling and online platforms. Participants were substance use service providers in California. Guided by the Rhodes' Risk Environment framework, bivariate and multiple regressions examine the factors associated with providers' perceived patient barriers to receiving substance use treatment.

Results: Average demographics of participants were White (62%), 30-39 years old (43.7%), 48.3% identified as women and 48.3% identified as men. Average participant experience working in substance use treatment was 7 years (range: 1-35 years). Preliminary findings reveal a lack of childcare (60%), waitlist times (61%), and withdrawal management services (63%) as organizational barriers to substance use treatment. Additionally, our data shows the patient barriers of mental health needs (63%), and interfering environmental aspects (lack of stable/supportive interpersonal and community environment-71%) as primary barriers to treatment.

Conclusions: These findings provide theoretical implications for the role of the risk environment in substance use treatment barriers. This study sheds light on persisting barriers so that they can be addressed through an organizational, community, and system-level approach.

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193 2:05 pm

The Effects of Patient Behavioral Events (PBEs)

Ryan Lizerbram, Psychology - Emphasis in Industrial & Organizational Psychology (U)

A southern United States hospital was invited to participate in a research study on the effects of patient behavioral events (PBEs), which are defined as any instance in which a patient has acted in a physically aggressive manner (e.g., hitting, kicking, scratching, biting) even if the actions were unintentional or did not cause serious harm. The present study demonstrated that PBEs are associated with stress-related outcomes, and it is known that stress-related outcomes can influence employee well-being and patient care. Furthermore, it was found that PBEs can create ripple effects beyond just the individuals directly targeted by the aggressive behavior.

The survey asked questions regarding participants' relationships with personally experienced PBEs, as well as PBEs that have been witnessed or heard about through coworkers. Additionally, the survey sought to measure participants' general work attitudes (e.g., job satisfaction, employee engagement, hospital attachment), behavior-based outcomes (e.g. work withdrawal behaviors, intentions to quit), and stress-related outcomes (e.g., burnout, emotional demands, work pressure). It was found that PBEs were associated with stress-related outcomes, but not general work attitudes or behavior-based outcomes. These effects are the same whether the PBEs are personally experienced or witnessed/heard about.

Session C-3

Oral Biological and Agricultural Sciences 3
Friday, March 4, 2022, 1:00 pm
Location: Mata'yuum

194 1:05 pm

Genomic Methods for the Modeling of Archaic "Ghost" populations in Modern Humans

Michael Kuzminskiy, Biological and Medical Informatics (M)

Anatomically modern human genomes are a mosaic of genetic material from human and archaic, non-human ancestors such as Neanderthals. Modern genomic methods have been previously used to track human ancestry and can reveal parts of the genome acquired from these archaic sources. However it is yet to be ascertained how the degree of ancestral hybridization from non-human ancestors has affected the distribution of genomic ancestry across modern human populations. Here we utilize extensive simulations under varying scenarios of the evolution of modern human populations to ascertain biases in estimates of evolutionary history.

We then retroactively identify parts of modern human genomes derived from archaic ancestors. These "signatures" can later be used to update our knowledge of how these archaic genes affect our health through the lens of pathology, and how we may use this knowledge going forward to assess various health concerns in key populations. One such goal is to use this knowledge to further our understanding of the genetic factors for the predisposition to cancer and how it can relate in proportion to the percentage of archaic introgression in our genome. This knowledge could also be applied to the current pandemic and our understanding of how archaic genes react to SARS-CoV-2.

195 1:20 pm

A new Enterobacteriaceae species that binds to the intestinal epithelial cells in the lumen of C. elegans and C. briggsae

Emily Morgan, Biology (U)

From ecological sampling, we find that wild Caenorhabditis nematodes are commonly associated with a diverse array of microbes, including bacteria, viruses, fungi, and microsporidia. In Bangalore, India, a wild C. briggsae strain (JU3205) was found with an unknown microbe adhering to the intestinal epithelial cells in the lumen of the gut. Phenotypically, this microbe appears to grow perpendicular along the internal sides of the intestinal lumen, giving it a bristle-like appearance. We see a near 100% penetrance with this microbe in the wild C. briggsae strain, and the microbe can easily be transferred to the wild-type N2 C. elegans through growth on the same plate.

In order to identify this intestinal-adhering microbe, we extracted a section of the C. briggsae intestine and verified that the adhering bacteria were still present and intact. Then, we conducted PCR using a universal 16S bacterial primer and identified a new species of bacteria in the Enterobacteriaceae family. To verify this identification, we created a unique fluorescence in situ hybridization (FISH) probe to this Enterobacteriaceaespecies and found it bound to bacilli in the lumen of the intestine, while a control wild C. elegans strain with a different adhering bacteria showed no signal. Furthermore, we used a series of cleaning protocols to remove other contaminating microbes from strain JU3205 and verified via FISH that the Enterobacteriaceae species is still present while other bacteria species appeared to be absent. Finally, we found that this adhering bacteria is pathogenic to its host due to a sever decrease in lifespan and brood size.

Altogether, we have discovered and identified a new species of Enterobacteriaceae bacteria that can bind to the apical side of intestinal epithelia cells in C. briggsae and C. elegans. As proof of principle for a forward genetic screen, we used an intestinal GFP C. elegans strain to validate a visual phenotype for bacterial adherence to the intestine. Given the pathogenic phenotype in the animals and their near 100% penetrance, we believe it can be established as a model system to study natural host-bacteria interactions in the intestine.

196 1:35 pm

Genome wide association of the Psyllid susceptibility in species of Eucalyptus

Rosalinda Diaz, Bioinformatics (M)

Eucalyptus moluccana is a species of tree native to eastern Australia. In recent years, this species has been infested with a type of Psyllid. Psyllids are insects that suck the sap out of the leaves, starving the tree of its nutrients and ultimately resulting in its death. Our first goal is to determine if other closely related species of Eucalyptus are also being infested or if it is specific to just E. moluccana. Based on the specificity of the Psyllids infesting primarily on E. moluccana, we suspect that there may be a trait associated in E. moluccana that the Psyllids prefer that may not be present in other subspecies of Eucalyptus. Our second goal is to identify certain regions in the genome that may be associated with E. moluccana's susceptibility to Psyllid infestation. A common garden was set up in a heavily psyllid-infested forest. Juvenile trees from E. moluccana and close relatives were planted to assess Psyllid preference. The presence of Psyllids in the trees were noted, and then colony counts were done to determine the severity of infestation in the trees found with Psyllids. To determine what genomic region may be associated with Psyllid susceptibility, DNA samples were extracted from the individual trees of E. moluccana and the other subspecies. These DNA samples were sent for sequencing. We will compare thousands of single nucleotide polymorphisms (SNPs) using a genome-wide association study (GWAS) to identify regions in the genome associated with psyllid susceptibility. There is a high Psyllid specificity with Eucalyptus moluccana having high infestation rates while very few eggs, if any, were found in other close relatives. Efforts are underway to analyze the genomic data to assess whether there is an association with Psyllid susceptibility in E. moluccana. There is a strong preference for Psyllids to infest E. moluccana as opposed to other closely related species. We predict that there may be a trait associated with the Psyllids' preferring the tree sap of E. moluccana as opposed to other species that remain unaffected and may lack this particular trait.

197 1:50 pm

Effect of UV Light Exposure and Compost Tea Supplementation on Growth, Antioxidant Activities, and Microbiome of Hydroponically-Grown Mustard Greens

Sherry Dinh, Food and Nutrition (U)

Projected global population increase creates greater demand for food production. With scarcity over water resources and arable land, there is a great emphasis on water and farmland management practices to ensure sustainable food production. Soil-less food production systems such as hydroponics may help improve food production efficiency by maintaining optimal growth conditions while using less space and water. However, the lack of exposure to UV light and soil microorganisms in a hydroponic system predisposes the plants to possible antioxidant inadequacy and disease susceptibility. With a hypothesis that exposing hydroponically-grown plants to UV light and beneficial microorganisms would stimulate synthesis of antioxidant phytochemicals and promote plant health, we analyzed the effect of such exposures on growth performance, antioxidant activities, and microbiota composition of hydroponically-grown mustard greens.

Garnet Giant mustard greens were grown hydroponically in both indoor and outdoor settings, with and without UV light blocking. Twelve-day-old seedlings were inoculated via foliage with an aerated vermicompost tea and grown for an additional 14 days. Plant growth and growing conditions were monitored. Moisture, nitrogen, and ash contents, leaf pigmentation, antioxidant activities, and microbiome of the mustard greens were analyzed.

The hydroponic systems exhibited 5.8-9.3 times more efficient water footprint than traditional vegetable production. Mustard greens in the greenhouses produced 7.3-9.0 times more dry mass than those grown indoors ($P< 0.01$). Compost tea supplementation boosted nitrogen and mineral accumulations in the absence of UV-blocking ($P<0.01$). Mustard leaves grown in the UV-passing greenhouse were predominantly red in color while those grown with reduced UV exposures lacked the pigmentation. UV exposure improved ABTS free radical scavenging activity, ferrous chelating activity ($P<0.01$), and ferric reducing power ($P<0.05$) of 80% methanolic extract of the mustard greens, while compost tea supplementation reduced the antioxidant activities ($P<0.05$). Compost tea inoculation resulted in approximately two log-fold increases ($P<0.05$) in beneficial bacteria Pseudomonas oryzihabitans and Leptolyngbya laminosa and a 5.8 log-fold decrease in fungal pathogens Alternaria carotiincultae ($P<0.01$).

Overall, exposure to UV radiation and beneficial microorganisms improved the performance and nutrient profile of the mustard greens.

198 2:05 pm

Genetic examination of a coral settlement chemical from bacteria

Amanda Alker, Cell and Molecular Biology (D)

Over the past few decades, the rate of coral reef decline outpaced mitigation efforts, which culminated in a call for new interventions to save coral reefs. Coral fitness is dependent on the microbial symbionts that reside on and within corals, leading practitioners to turn to microbe-mediated techniques, such as microbiome manipulation and probiotic treatments. Microbes that generate signals for larval development and metamorphosis are among the desirable qualities of coral probiotics currently being screened. One promising signal is a molecule produced by bacteria called tetrabromopyrrole, which induces robust metamorphosis with and without attachment in a wide range of coral species. While previous studies have linked bacterial production of tetrabromopyrrole (TBP) to coral metamorphosis, we currently lack the genetic tools to interrogate the production and function of TBP from bacteria as coral probiotics. In this study, we develop genetic tools for the metamorphosis-inducing bacterium, Pseudoalteromonas sp. PS5, to explore TBP-induced metamorphosis in corals. We find that a deletion of the brominase gene, bmp2 disrupts TBP production and ablates the bacterium's ability to stimulate metamorphosis in the coral, Porites astreoides. To address why some species of Pseudoalteromonas encoding a bmp gene cluster are better at inducing metamorphosis than others, we compared TBP production among related strains, which revealed that specific genetic architectures of the biosynthesis gene cluster are important for the ability to induce metamorphosis. These results attribute TBP production from live bacteria to the stimulation of metamorphosis in corals and bring us closer to using genetics-based approaches for improving coral probiotics.

199 2:20 pm

A Bacterial Lipase Stimulates Animal Development in a Marine Tubeworm

Kyle E Malter, Biology (D)

Bacteria-animal interactions play a widespread role in stimulating the developmental transitions of marine invertebrates. While these interactions are critical for processes such as coral reef formation, life history transitions, and biofouling, we know little about the mechanisms mediating these beneficial bacteria-animal interactions. In many marine invertebrates, bacteria stimulate the initiation of metamorphosis from the larval to juvenile forms. However, the bacterial products that stimulate metamorphosis and their mode of action remain unclear. In the marine tubeworm Hydroides elegans, Metamorphosis Associated Contractile structures (MACs) produced by the bacterium Pseudoalteromonas luteoviolacea are necessary and sufficient to stimulate metamorphosis. Our lab has previously identified a protein effector sufficient to induce Hydroides metamorphosis, however it is currently unknown how this protein functions when injected into the Hydroides. Here, we show that a protein loaded within the MACs structure termed Metamorphosis Inducing Factor 1 (Mif1) binds to the signaling glycerolipid phosphatidylinositol and possesses lipase activity, which cleaves the phosphate headgroup producing phosphatidic acid and a phosphoinositol. We identify a 150 amino acid portion of Mif1 that is required for this lipase activity and hypothesize that this lipase activity is necessary for Mif1's ability to stimulate Hydroides metamorphosis. This activity gives insight into the beneficial interaction that takes place between a bacterium and its animal host. Our finding identify the first bacterially produced protein and describes its function stimulating metamorphosis through lipase activity. This finding demonstrates a role for bacteria in the life-history transition within marine invertebrates and our insights into bacteria-animal sensing systems reveal a mechanism of bacteria stimulated development never identified before in animals.

Session C-4

Oral Humanities, History, Literature, Philosophy 3

Friday, March 4, 2022, 1:00 pm

Location: Aztlan

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201 1:20 pm

Foundations for Sino-American Rapprochement: Mao's Ambiguous Revolution, 1964-1968

Ryan Garcia, History (M)

The February 1972 handshake between American President Richard Nixon and Chinese Chairman Mao Zedong represented a shocking end to a decades-long frozen relationship. Mao's willingness to rebuild a relationship with the United States came during a time of great domestic upheaval: The Cultural Revolution (1966-1976). Mao argued to the Chinese people that China needed to be purified of imperialist and revisionist influence, so a true communist society can flourish. The move to rebuild relations with the United States, the chief capitalist country, was the very antithesis of what Mao argued for years. This paper analyzes the lead-up to the Cultural Revolution and its beginning years to investigate Mao's thoughts on revisionism, how it penetrated Chinese society and how it was exported abroad in the form of the Cultural Revolution.

Examining a series of primary sources — from elite level sources, ranging from Mao's speeches, domestic and international conversations, and party directives, to incorporating non-elite sources, namely Red Guard memoirs — the paper demonstrates how Mao's battles against revisionism created a gray area for people to argue for different visions of eliminating revisionist behavior. This gray area resulted in a fluid environment, in which the Chinese people needed to adapt to constantly changing definitions of what constituted following Mao's vision. By the end of 1968, Mao gained total control of China through co-opting various organizations, including the Red Guards, the military, and propaganda groups, while also having room to maneuver with his own policy decisions.

This research lays crucial foundation for how the Cultural Revolution assisted Mao's plans for Sino-American rapprochement in the early 1972. Often, this period is marked as an aberration in Chinese foreign relations, but this paper argues that there are continuities that link the Cultural Revolution to one of the most surprising foreign relations twists in the twentieth century. This paper's analysis of the critical role of domestic forces in foreign policy is a useful reminder to those observing the current negotiations between the US and China.

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202 1:35 pm

Better off Home? Disparate Perspectives on the United States' Evacuation Efforts in South Vietnam 1975

Brian Nguyen, History (M)

After the Fall of Saigon 1975, 1.6 million refugees would come to leave Southeast Asia in a twenty-year diaspora. Of these refugees, a notable group would come from the 130,000 South Vietnamese refugees who left their country right after the war ended. With the United States' role in the Vietnam War, the county's efforts would become a crucial factor for many of these refugees' flight from their homeland.

While the United States often portrays this as a humanitarian effort, Soviet and Vietnamese reports harbor accusations that the evacuation only served to distract from a failed foreign policy. Spreading fear among the South Vietnamese, Vietnamese broadcasts argue that their people were subjected to horrid camp conditions and denied their right to return home. According to American documents and evacuation plans, however, the United States presents itself as a country responding to a refugee crisis created by the North Vietnamese Army and assisting those who feared for their lives.

Exploring how both the United States and Vietnam would come to use the South Vietnamese refugees towards their own propaganda efforts, nuances in this humanitarian struggle come to light. In addition, taking the experiences of refugees and reeducation camp prisoners into account serves to add a greater emotional factor that cannot be considered through only observing low politics. As neither the United States nor Vietnam could be seen as completely innocent in how they handled the South Vietnamese refugees, South Vietnamese experiences help reveal their own agency despite each country's efforts.

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203 1:50 pm

The Reagan Administrations Legacy: Cold War Policies and The Refugee Act of 1980

Phoebe Lutz, Political Science (U)

Refugee admission statistics in the United States have fluctuated noticeably throughout history largely as a result of varying attitudes of presidential administrations in office. Contributing to this, the implementation of the Refugee Act of 1980, which defined refugees as having to have a well-founded fear of persecution, only further contributed to the development of differing stances by presidents on refugee admissions. Reagan utilized the Refugee Act of 1980 to further his own political agenda during an era encompassed by the concept of containment of communism in South and Central America.

Reagan spoke openly about his view of individuals seeking asylum from Central American countries as being economic migrants rather than refugees, so he used this definition in his favor, distinguishing between refugees who he believed had credible well-founded fears and those who he saw as solely in pursuit of economic opportunities. This distinction was greatly fueled by the fact that United States aid and involvement was notably higher in the Central American countries that saw a considerable number of asylum seekers at the border. It was through the altering of the Refugee Act in favor of Reagan's position that admissions were disproportionately lower for refugees of certain countries, notably El Salvador, Honduras, and Guatemala. Consequently, with great thanks to the attitudes of the Reagan administration, presidents since the end of the Cold War have been altering this definition of a refugee to fit their own approaches to immigration and refugee policies. We see this notably from admission statistics during President Bush's administration directly following 9/11 as well as from President Trump's administration, which frequently pushed a Christian nationlist agenda and imposed a Muslim ban during its time in office. To conduct my research, I used primary and secondary sources from government, academic, and other reputable sources to explore the influence of the Reagan-era interpretation of refugees on later administrations.

And although there are varying degrees of refugee admission statistics depending on the political agendas, it is nonetheless clear that the legacy of the United States' approach to the Cold War and containment of communism in Central and South America continues to influence policy today.

204 2:05 pm

Sino-Peruvian Communism: Transnational Currents in Sendero Thought in the Twentieth Century

Daniel Cook, History (M)

The Shining Path (Sendero Luminoso) insurgency initiated its armed conflict against the Peruvian state in 1980 by burning ballot boxes at a local voting registrar office in Chuschi, a small town located in Ayacucho. Under the leadership of philosophy professor Abimael Guzmán Reynoso, the group had embarked upon a years-long struggle that claimed roughly seventy thousand lives. Radically violent and marginal among Peru's litany of leftwing organizations, Sendero scholarship has often focused on this organization's efforts to universally and ahistorically impose Maoist revolutionary doctrine in Peru. Although there is no doubt that Shining Path interpreted Peru's social, political, and economic difficulties through a Maoist framework, few scholars have situated Sendero within Peru's own intellectual historical context. The present work places Sendero ideology at the intersection of local and transnational intellectual traditions.

My analysis pursues two lines of inquiry about Sendero. The first one considers Sendero's ideological relationship with Maoism while the second considers its relation to the local Peruvian intellectual tradition. In my first line of inquiry, I place Shining Path in dialogue with seminal texts written by Mao Zedong to critically evaluate how leading Senderistas interpreted Maoism. I further argue that Mao's own ideological shifts over the course of his lifetime problematizes the notion that an orthodox Maoism is identifiable and usable as a comparative tool. Instead, it is more accurate to say that Shining Path adhered to specific Maoist writings while rejecting others. In my second line of inquiry, I place Shining Path in dialogue with José Carlos Mariátegui, the founder of the Peruvian Communist Party, to establish that Shining Path's self-proclaimed Maoist purism was made possible by Mariétegui's laborious integration of a Cuzco-based intellectual indigenism (cuzqueño indigenismo) and Marxist socialism over thirty years prior to the establishment of the pro-Chinese Partido Comunista del Perú—Bandera Roja. My work therefore aims to present a comprehensive examination of Sendero ideology that goes beyond the portrayal of Shining Path as a Maoist movement in the Andes. Rather, Shining Path represents a revolutionary and radically violent organization born out of the interaction between local and transnational currents.

205 2:20 pm

Amerasain Diplomacy (or Lack Thereof): The Cold War Relationship Between the United States and the Philippines

Catherine Drzewiecki, History (M)

The United States passed the Amerasian Immigration Act (1982) to ease the immigration process for Amerasian children (children born in Asia to US servicemen and Asian mothers). This legislation included a number of countries but failed to include the Philippines, which was home to thousands of Amerasian children. While scholarship has focused on Vietnamese (Robert S. McKelvey, 1999) or Korean Amerasians (Arissa Oh, 2015), very little has been written on Filipino Amerasians. This paper explores the context for the Amerasian legislation in order to explain the exclusion of Filipino Amerasians. That important context is found in the documentary historical record of major US foreign diplomacy decisions and diplomatic activity regarding the Philippines from the Kennedy administration to the Reagan administration. This paper places the strategic significance of the Philippines during the Vietnam war and fight against communism in conversation with the political significance of the Amerasian legislation. American military bases in the Philippines at sites like US Naval Base Subic Bay and Clark Air Force Base gave the United States secure access to the Asian continent as a whole and US service members access to Filipino women with whom they had children. Because of the unique post-colonial relationship between the United States and the Philippines, the Filipino Amerasians did not fit the political narrative of the "Amerasian problem." Unlike other Amerasian children born out of war, the Filipino Amerasian children were born as a result of US military bases.

Session C-5

Oral Engineering and Computer Science 3
Friday, March 4, 2022, 1:00 pm
Location: Metzli

(U) = Undergraduate; (M) = Masters; (D) = Doctoral

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206 1:05 pm

Maximizing Ultrasonic Inspections Sensitivity in Composite Laminates by Analytical Calculation of Ultrasonic Scattering

Alexander Donabedian, Aerospace Engineering (U)

Ultrasonics is a common and effective non-destructive technique used in the engineering and medical fields for its safety of implementation and quality of information. Defect detection and materials' property evaluation results from the processing of ultrasonic wave propagation, without further damaging the structure during inspections.

This research focuses on the investigation of fundamental ultrasonic principles of elastic wave propagation with the goal of optimizing the experimental set-up and data analysis of NDE to maximize sensitivity to material properties changes and defect detection. When sending bulk waves through media, various angles of excitation result in different magnitudes of the reflected (R) and transmitted (T) waves. The higher the magnitude, the more likely the wave can penetrate/reflect within/from the material and accurately assess its health.

This work focuses on developing a generalized analytical tool to calculate the optimal angle of excitation that will result in the maximum magnitude of the reflected and transmitted coefficients. The study has focused on laminated composite materials, due to their superior tailorable mechanical properties, analyzed with a variety of interfaces. The resulting reflected and refracted coefficients plotted for incident angles ranging from 0° to 90° allow us to determine which incident angle produces the maximum magnitude of each coefficient. This systematic approach enables the examination of a variety of laminate lay-ups (i.e. constituents' properties, laminae angles) and coupling media. The research has identified optimal angles for a transmitted longitudinal wave inspecting a 16-plies CFRP quasi-isotropic laminate and two cross-ply laminates. The high variation in optimal incident angle for different groups of plies within the laminate suggests the possibility to optimize inspection at specific interfaces. The results show that the maximum reflection happens at the interface between water and "sub-laminate 2", suggesting that changes in the reflected waveforms are due to the wave interaction with specific groups of plies within the 16-plies laminate.

These preliminary studies can be used to interpret and quantify C-scan data, and set the foundations for more complex numerical tools to predict wave scattering, that, through the employment of guided waves, can be extended to wide-area rapid scanning of aerospace structures and biomedical applications.

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207 1:20 pm

Spectro-Microscopic Characterizations of Impact Mitigating Polymers

Nha Uyen Huynh, Mechanical Engineering (D)

Polyurea, a thermoset elastomer consisting of inter-dispersed domains of hard and soft segments, is a technologically exciting material for many different implementations, particularly for impact mitigation in civilian and military applications. The novelty of this research is contingent on the concurrent exploitation of two unique experimental setups, namely, laser-induced shock waves (LSW) and terahertz time-domain spectroscopy (THz-TDS). A bulk spectroscopic technique, i.e., THz-TDS, is integrated with a laser-induced shock loading apparatus to investigate the molecular conformational changes in polyurea under ultrahigh strain rate loading. The laser-induced shock wave technique is used to simulate ballistic loading scenarios to reveal the mechanical response of polyurea under extreme loading conditions. LSW can submit the test material to strain rate exceeding 106 s-1 at low strains (<<1%), thus, enabling the determination of the intrinsic failure modes and strength. Uniquely, we report plastic deformation of polyurea, i.e., ductile failure despite the shock loading conditions. The deformation induced using the LSW changes the conformations of the polymeric molecules, which can be detected spectroscopically using terahertz waves. Therefore, terahertz-based spectroscopy is incorporated into the shock loading experimental setup to detect the conformational changes in the molecular structure of polyurea undergoing shock loading. The spectral changes identified in the THz regime of the sample before and after shock-loading substantiate the validity of terahertz spectroscopy in providing evidence of intermolecular conformations associated with the impact mitigating properties of dynamically loaded polyurea. Moreover, microscopic techniques, such as atomic force microscopy and scanning electron microscopy, are used to elucidate changes in the microscale properties, topography, and morphology. In all, this research features a multiscale characterization experimental framework for the intrinsic mechanical and structural attributes of polymers, where the results can be used to accelerate and improve the development cycle of polymeric material systems.

208 1:35 pm

Carbon Black Particle production in Flame Spray Synthesis

Kaylin Sabado, Mechanical Engineering (U)

This research focused on the method of producing carbon black particles by direct flame synthesis. Analysis was conducted on the effects of different oxidizing conditions and varying the precursor concentrations of coal tar distillate. This research demonstrated that the carbon black particle flame spray pyrolysis (FSP) synthesis can be a scalable method while undergoing oxidizing conditions and shorter residence times.

Two different series of flames were used to separately analyze the particle effects of excess oxygen in the pilot flame, and varying the percent volume of coal tar distillate in the liquid feed (diluted by toluene fuel). It was found that with higher concentrations of oxygen and coal tar distillate concentrations in the pilot flame, the flame luminescence and height is greater. Flame temperatures were obtained using a thermocouple and produced higher temperature results for both excess oxygen/lower equivalence ratios, and higher percent volumes of coal tar distillate. The increased volume of the coal tar distillate had

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less of a distinct difference on the flame temperatures than that of excess oxygen on the flame temperatures. For particle size and shape, median primary particle diameters may be smaller at lower equivalence ratios due to the oxidation which hinders particle growth. Furthermore, increased volume of coal tar distillate can influence larger aggregate particle sizes. It was also found that lowering the atomizing nitrogen flow rates (which affects spray droplet sizes) produces larger particle diameter sizes. Therefore, atomizing flow rate is another flame condition that can be manipulated to increase or decrease primary particle diameters. In essence, increasing the amount of oxygen flow and increasing the volume of coal tar distillate can produce higher flame temperatures. However, adjusting the atomizing flow rate, decreasing the pilot oxygen flow, and increasing the amount of coal tar distillate can produce larger carbon black particles. Although this process lacks a pyrolysis reactor and produces a much smaller yield of particles than conventional carbon black synthesis methods, this research is acceptable for investigating these varying parameters (equivalence ratio/oxygen flow rates, and precursor make-up ratios) and their effects on the flame combustion and particle growth.

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209 1:50 pm

A 3.75 nW Analog Electrocardiogram Processor Facilitating Stochastic Resonance for Real-Time R-wave Detection

Cihan Gungor, Electrical and Computer Engineering (D)

An energy-efficient real-time processor that enhances R-waves in an electrocardiogram (ECG) signal is presented. The processor leverages a non-linear filter that models a system consisting of a particle inside a monostable well potential. The system is known to facilitate stochastic resonance (SR), where additive noise helps improving detectability of a weak signal. The processor is designed using analog signal processing techniques for simplicity of implementation and energy efficiency. Based on the schematic-level circuit simulations on the MIT-BIH arrhythmia database, the processor achieves an average sensitivity of 99.78% and an average positive predictivity of 99.65%. The power consumption excluding the bias circuitry and the thresholding stage is 3.75 nW with 1V supply voltage. The results serve as a proof-of-concept demonstration towards facilitating SR in practical signal enhancement and detection scenarios with limited power budgets.

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210 2:05 pm

Hydrodynamic Modeling and Control of a Wave Energy Converter Device

Rodolfo Callado, Mechanical Engineering (U)

Interest in wave energy is increasingly growing along with the rising demand for renewable energy, but wave energy conversion is yet to reach a point of commercial viability. This is primarily due to the high cost of physically testing wave energy converter (WEC) models. Because of these high costs, test models are being studied numerically to better understand their behavior and optimize device performance and survivability. The focus of this study is to accurately simulate the dynamics and control of a vertical cylinder point absorber WEC heaving on the ocean surface. This study compares a boundary element method (BEM) based linear solver with a fully nonlinear computational fluid dynamics (CFD) solver. The BEM solver developed in MATLAB is computationally efficient under the assumption of small body motions. The CFD solver is an open-source software, known as the immersed boundary adaptive mesh refinement (IBAMR). A receding horizon, model predictive control (MPC) strategy is implemented in both solvers to optimize the device's performance. Results show that for an uncontrolled device, the BEM-based solver accurately simulates the dynamics in comparison to the CFD solver. When the MPC strategy is used, results show that the BEM-based solver accurately resolves the dynamics for sea states with small wave heights. However, when the wave height is large, the BEM solver overpredicts the dynamics and the power absorbed by the device and produces unrealistic results. The CFD solver comes with a much higher computational cost, but the results are far more accurate and realistic.

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211 2:20 pm

Miniaturized Printed Square Loop Antenna

Nhat Truong, Electrical Engineering (M)

In this work, a highly miniaturized square loop antenna (SLA) has been designed for operation at the 2.4 GHz ISM band. The antenna has been loaded using a simple series combination of two lumped inductors and two interdigitated capacitors in order to realize inherent impedance matching with respect to a given source impedance, without the need of any external matching network. The designed antenna has an overall size of 0.058ɪ×0.058ɪ, which is approximately 76% miniaturized in terms of total length and 94.6% miniaturized in terms of footprint. Full wave studies have been performed using Ansys HFSS considering the effects of a balun structure that was added only to characterize the antenna. The fabrication for this design is completed and will be tested in far field anechoic chamber at AML (SDSU). The simulated and measured results will be demonstrated during Student Research Symposium (SRS).

Session C-6

Oral Business Economics and Public Administration / Education 1

Friday, March 4, 2022, 1:00 pm

Location: Templo Mayor

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212 1:05 pm

Analyzing Adoption of Self-Service Analytics

Melarie Cardenas, Cybersecurity Management (M)

Self-service Analytics (SSA) help users to analyze and interpret business data without needing Information Technology teams

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to help curate business decisions. By examining the different aspects of SSA technologies, from features to affordances, we can examine how to tackle the adoption of SSA. However, the adoption rate of SSA tools has still been low; thus, leading to the necessity of research in SSA to help motivate the usage of these tools by looking at what hinders and empowers usage among employees at the early stages of SSA application.

Looking at SSA through a sociocultural lens, this framework helps us to look at how the tools and their features can motivate the usage of them. The framework we're applying is the Needs-Affordances-Features (NAF) to study the psychological motivations behind these self-service analytics tools. By analyzing the usage of these tools, we can look at 13 affordances that show users their potential actions through the properties of these tools. Each affordance helps us fulfill five core psychological needs examined in employees: autonomy, competence, relatedness, having a place and self-realization. This study proposes that these 13 affordances can be identified in five main knowledge features — co-creation, exchange, integration, application, and assessment — to help bridge the relationship between psychological needs and SSA applications.

Generating important implications for SSA research, this study hopes to provide a framework for SSA tools and their affordances to help explain the importance of psychological needs that motivate and encourage the usage and adoption of these tools. Providing a new lens for future studies and SSA tools' design, we hope to use what we have learned in this study to call for a shift in how SSA tools are implemented and enforced. By identifying this, we hope that SSA can be more widely and universally adopted to help leverage knowledge creation, sharing and management.

213 1:20 pm

Cybersecurity and Risk Initiative in Big Accounting Firms: An Experimental Perspective

Claire Wu, Accounting (U)

Human error is still the number one cause of data breaches. Accounting firms need cybersecurity awareness to protect confidential client data and firm reputation. As the complexity of technology advances, organizational commitment to employee education regarding the risks of cyberthreats and basic protective measures is more important than ever before. Limited to no research has been conducted on employee experience and engagement in cybersecurity training initiatives. The objective of this study is to conceptualize a practical cybersecurity training process that includes the relationships between training initiatives, employee training experience, and outcomes. This research is grounded in employees' emotional, cognitive, social, and behavioral experiences in response to cybersecurity training resources and capabilities in big accounting firms. The study addresses limitations and guides companies to implement employee-focused training and initiatives to promote cybersecurity awareness culture at individual, team, client, and organizational levels. The research design is a qualitative, interpretive case study involving interviews with 15 professionals working at big accounting firms. Based on the findings from the case study, the paper builds a framework that operationalizes the concepts embedded in the practical cybersecurity training model and develops a set of guidelines for companies' cybersecurity and risk initiatives. Results reveal that several training initiatives are related to positive and negative employee training experiences, which impact outcomes for all levels of the organization.

214 1:35 pm

Employee Experience with Digital Transformation: From Culture Readiness to Active Participation

Emma Tsztoo, Psychology (U)

Digital transformation (DT) is increasingly fundamental for organizations to not only implement, but thoroughly understand and dictate. Recent studies suggest that DT is not limited to the process of implementing digital technology to enhance business performance; it is the process of harmonizing organizational goals, values, and culture with employees by the means of digital technologies. Therefore, it is critical to understand DT and determine its success from the perspective of the employee. To further understand the role of employees in DT, this paper theorizes and validates the relationships between DT cultural readiness, employee experience with DT, and active participation in DT implementation. The findings guide theoretical and practical development in the field.

215 1:50 pm

A comparison of expert and novice interpretation of multiple biology diagrams

Tina Marcroft, Math and Science Education (D)

Phylogenetic trees are complex diagrams integral to many subdisciplines of biology, yet educators have struggled to help students make sense of them. These diagrams consist of lines coming together at points, depicting patterns of evolution often occurring over large spans of time. These diagrams, however, confusingly depict what is essentially a multidimensional process as linear and sequential. Undergraduate students have been shown to interpret certain features as conveying meanings unintended by the creators of these diagrams; students will, for example, interpret the most lateral and largest line as depicting a sort of linear progression rather than a series of equally significant splitting events. While recent work has documented some of the different ways students interpret these diagrams and the best practices for creating more intelligible diagrams, little attention has been devoted to understanding differences in expert and novice interpretation of these diagrams, specifically how they assign meaning to features. In addition, phylogenetic trees occur in an unusually wide variety of formats compared to diagrams common in other scientific disciplines. To investigate this phenomena, we interviewed four biology faculty and undergraduate students to understand how experts and novices differ in their understanding of different diagram types. As expertise is often characterized by being able to flexibly interpret or translate between different contexts, we examined how this might be occurring and how this might differ by having participants compare and interact with a variety of tree types.

We used a qualitative method known as Grounded Theory to interrogate our interview transcripts for themes. Our preliminary results surprisingly suggest that experts may not necessarily be cognizant of the features they attend to, however the features they do attend to appear to be consistent across tree types. We also find that the meaning assigned to those features are relatively static across diagrams. Novices, however, attend to a wider variety of features, as suggested by the literature. Rather than attend to the "core" features, they attend to "surface" features that differ across tree types.

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216 2:05 pm

Maternal Education and Academic Performance of Kindergarten Students During the COVID-19 Pandemic

Hilda Parra, Language and Communicative Disorders (D)

Academic performance of students from a background with higher levels of maternal education has traditionally been associated with higher academic achievement in the areas of reading and mathematics in comparison to households with lower levels of maternal education (Zadeh et al., 2010). Given pre-existing disparities, there is reason to believe that the change from in-person to remote learning, as a preventative measure of the COVID-19 pandemic, would disproportionately affect the reading gains of kindergarten children of lower SES households increasing the disparities

(Bao et al., 2020). We had a unique opportunity to test this through an ongoing longitudinal study that spanned the onset of the pandemic. We report how the academic performance of kindergarten students during the last two quarters of in-person classroom learning and the first quarter of remote instruction is influenced by maternal education level. We tested five- to six-year-old children at three time points from fall 2019 (n = 53, mean age = 5.99, gender = 29 F) to spring 2020 (n = 40, mean age = 6.64, gender = 23 F) using two tests from the Woodcock Johnson Tests of Early Cognitive and Academic Development (ECAD) (Number Sense and Letter Word Identification) to measure performance of quantitative and literacy skills. The students were divided into groups based on reported maternal education (high school or less and some college or higher). Our preliminary results corroborate prior findings of disparities in academic performance across students based on maternal education level, across all measured time points. Novelly, we demonstrated that these disparities increased during the first quarter of school instructed remotely. In particular, only students from households with higher maternal education levels experienced significant improvements in their performance of quantitative and literacy skills across the transition to remote learning. In contrast, students from households with lower maternal education levels did not show improvement across the transition to remote instruction. These results support our hypothesis of increased academic disparities associated with maternal education during the transition to remote instruction. Potential future directions include quality assessments of technological resources available in the home environment and additional comparisons with grade point average.

217 2:20 pm

Parent Stress and Parent-Child Interaction in Children at Risk for Early Autism

Tina Ali, Child and Family Development (M)

The current study aims to examine the relationship between parent stress and parent-child interactions in young children at risk for autism. Research examining parent stress has indicated that parenting stress affects parenting practices. Stress management interventions have been found to effectively reduce the stress of parents with children with developmental disabilities, but there are a limited number of studies that examine the impact of stress on day-to-day interactions within these families (Lindo, Kliemann, Combes, & Frank, 2016). We will examine the relationship between a parent's stress level and positive parenting behaviors in a snapshot of parent-child interaction. This relationship will inform the need for stress-focused interventions for families of young children with autism. Participants will be 40 children between the ages of 12-30 months at enrollment. Each parent will complete a set of standardized questionnaires, including the Parenting Stress Index, and record a 10-minute long play interaction with their child to be coded using the Parent Interactions with Children: Checklist of Observations Linked to Outcomes (PICCOLO). Looking closely at family relationships and how stress affects the whole family, it is hypothesized that parents with higher levels of stress may engage in fewer positive parenting behaviors during parent-child interaction.

Session C-7

Oral Health Nutrition and Clinical Sciences1
Friday, March 4, 2022, 1:00 pm
Location: Visionary Suite

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218 1:05 pm

Effects of Blenderized Watermelon Consumption On BMI, Body Fat, and A1C in Overweight or Obese Children

Jaikko Daughtry, Nutritional Science (M)

Childhood obesity increases risk factors related to metabolic diseases and watermelon's bioactive components can help reduce these risk factors. However, no study has investigated the effects of watermelon juice containing rind in children with obesity or overweight. The objective of this study was to examine the effects of blenderized watermelon with rind on anthropometric and clinical markers. We hypothesize that the consumption of blenderized watermelon will improve BMI, body fat, glucose, insulin, A1C, inflammation, lipid profile, liver function enzymes, and satiety hormones. A randomized, cross over clinical design was implemented where children (n=17, 8 females/9 males, age 12.9 ± 2.0 years) consumed one cup (240 mL, 70kcal) of blenderized watermelon juice with rind or isocaloric sugar juice (control) every day for eight weeks with a four-week washout period. Significantly lower BMI ($p = 0.032$) and BMI percentile ($p = 0.038$), were observed when comparing eight weeks of watermelon juice intake to eight weeks of sugar juice intake. Sugar juice consumption increased BMI percentile (p = 0.014) compared to baseline. A decrease in body fat, measured with Bod Pod within watermelon juice consumption was observed, but not in sugar juice (p = 0.047). Body fat was lower in watermelon juice than sugar juice intake at week eight (p = 0.036). A decrease in A1C was observed within watermelon juice intake (p = 0.008) but not with sugar juice intake. A1C watermelon juice week eight was lower than sugar juice week eight (p = 0.012). No significant differences between trials were observed for leptin, ghrelin, c-reactive protein, glucose, insulin, lipid profiles, and liver function enzymes. The results support that blenderized watermelon juice consumption improved cardiometabolic risk factors including BMI, BMI percentile, body fat, and A1C in desirable directions. To our knowledge, this is the first study examining the effects of watermelon juice with flesh and rind consumption on cardiometabolic risk factors in overweight/obese children. Our study shows that watermelon is a potential alternative to unhealthful snacks for reducing the risk factors related to obesity.

219 1:20 pm

Night owl vs Early larks: Effect of chronotype on olfaction and diet quality

Alyssa Scruggs, Food and Nutrition (U)

Chronotype reflects an individual's preferred time of the day for an activity/rest cycle. Literature suggests that in comparison to morning chronotypes (known as early larks), late chronotypes (known as night owls) engage in unhealthy dietary habits and thus are at high risk for metabolic disorders. An unhealthy dietary intake is also associated with impairment in smell perception. However, the relationship between smell capacity, dietary intake, and chronotypes is unknown. In this ongoing pilot study, we test if evening chronotypes have impaired smell perception and if that influences diet intake. Healthy-weight participants completed the Morningness-Eveningness questionnaire (MEQ) to determine their chronotype. They also completed a validated 40-item University of Pennsylvania Smell Identification Test (UPSIT) to test their olfactory function, completed a food craving questionnaire in a fasted state, and completed a 3-day food diary to determine diet quality. Based on the MEQ responses, our sample includes n=8 adults with morning chronotype (age 22.8 ± 3.7 yr, body mass index 22.4 ± 3.7 kg/m2) and n=6 evening chronotype (age 22.5 ± 2.7 yr, body mass index 22.7 ± 2.6). The UPSIT score was higher (p = 0.06) in the morning chronotype (34.8 ± 4.5), compared to the evening chronotype (34.5 ± 2.1) suggesting greater olfactory impairment in the evening vs morning chronotype. In line with previous research, 75% of evening chronotype participants skipped breakfast, which is related to a high risk of obesity and insulin resistance. Though not significant, we also observed a trend towards higher intake of total calories, carbohydrates, fat, and sugar later during the day (after 8 pm) in evening chronotypes. We did not find any correlation between poor olfactory assessment scores and diet quality, potentially due to the small sample size. Our results suggest that evening chronotype may have impairment in olfactory function. We also support findings from other studies suggesting a misalignment between chronotype and dietary intake pattern. As we continue to collect data, will be able to get a better understanding of how olfactory function may have an impact on dietary intake in evening chronotypes.

220 1:35 pm

Age, Period, and Cohort Differences in Diet Quality among Women from the California Teachers Study

Vanessa Balingit Valdez, MPH - Epidemiology (M)

Diet quality has declined among United States (US) adults over the last century. Although the relationships between age, period, and cohort and diet quality have been studied in various settings and populations, few studies have been conducted among US adults. In this study, we investigated the differences in diet quality by age, period, and birth cohorts, and changes in diet quality over time among active and retired female teachers and administrators living in California. This study included 55,234 women from the California Teachers Study (CTS), an ongoing, prospective cohort study. Diet quality was assessed using the Alternate Healthy Eating Index (AHEI) 2010 calculated from a 103-item, semiquantitative food frequency questionnaire at enrollment in 1995 (baseline period) and 10-years post-baseline in 2005. The continuous AHEI-2010 index was categorized into quintiles indicating low (Q1) to high (Q5) diet quality. The exposures of interest were participant age and 10-year birth cohorts. We used ordinal logistic regression to examine the associations between AHEI-2010 index quintiles and the exposures of interest. Other covariates of interest included race (White or Black), ethnicity (Hispanic/Latina Not Hispanic/Latina), hours of exercise per week, body mass index (<18.5, 18.5-24.9, 25.0-29.9, or >30.0 kg/m2), and smoking status (never, former, or current smoker). At baseline, mean age increased as the AHEI-2010 index quintiles increased. Participants born in earlier decades (1900-1909, 1910-1919, and 1920-1929) were mostly found to be in either Q4 or Q5 while participants born in later decades (1950-1959 and 1960-1970) were mostly found to be in either Q1 or Q2. For instance, among adults born in 1900-1910, 47.6% were in the AHEI-2010 index Q5 while only 11.9% of adults born from 1960-1970 were in Q5. The 1940-1949 birth cohort had roughly the same amount of participants distributed among each of the quintiles. Additional results are pending. Diet quality has decreased over time in this population of California adults. Public health efforts focused on improving diet quality should be enacted as poor diets increase the risk of chronic disease in later life, and related mortality.

221 1:50 pm

A Preliminary Analysis of Concussion Disclosure in Military Service Members

Jennifer Vanderschaege, Athletic Training (U)

Context: Military service members are highly active individuals that suffer from athletic injuries like concussions. Injuries, including concussions, could involve symptom burden that may impede productivity and result in light duty. Research has found that the sooner one seeks care for a suspected concussion, the sooner their symptom burden may decrease. However, many factors influence one's decision to conceal or seek care for a suspected concussion. The purpose of this study was to determine if there was a relationship between warrior identity and concussion disclosure intentions.

Methods: Participants completed a cross-sectional survey of the Warrior Identity Scale (WIS), disclosure intentions (symptom and concussion), and demographics via Qualtrics (n=10; male=90%, n=9/10, missing=10%, n=1/10; active duty=60%, n=6/10, Veteran=30%, n=3/10, missing=10%, n=1/10; age=27.8±8.41 years).The WIS is divided into the following sections: identity exploration, identity commitment, public regard for the military, private regard for the military, military centrality, and military connection. WIS items were rated on a 5-point agreement Likert-scale and averaged for each section. Symptom and concussion disclosure intentions were rated on a 7-point agreement Likert-scale and also averaged. We calculated relationships between WIS sections and disclosure intentions (symptom and concussion) using Pearson and Spearman's rho correlations.

Results: Some significant positive relationships were found in sections of the WIS. A significant positive relationship was found between private regard for the military (r=0.674, p=0.047), military centrality (r=0.701, p=0.035), and symptom disclosure intentions. When private regard for the military and military centrality increased, so did symptom disclosure intentions. There was also a significant positive relationship between identity commitment (rs=0.781, p=0.013), military centrality (r=0.790, p=0.011), and concussion disclosure intentions, such that as identity commitment and military centrality increased, so did concussion disclosure intentions.

Conclusion: In conclusion, our preliminary analysis shows that the higher the military service members' regard towards the military, the higher their disclosure intentions. Clinicians may consider that those with higher regards towards the military may be more forthcoming in their concussion disclosure intentions. However, future research should determine if this is also true for concussion disclosure behavior.

Abstracts of Presentations

Session D

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UNIVERSITY

(U) = Undergraduate; (M) = Masters; (D) = Doctoral

Session D-1

Oral Behavioral and Social Sciences 8
Friday, March 4, 2022, 3:00 pm
Location: Legacy Suite

222 3:05 pm

Co-Management of a Small-Scale Fishery in Moorea, French Polynesia

Paige Dawson, Anthropology (M)

As the adverse effects of climate change continue to accelerate, the need for effective approaches to conservation has become integral to working towards a more sustainable future for our planet. Community-based frameworks are often posited as the key to success in effective conservation projects; however, what is considered “success” can vary across the different stakeholder groups involved. This study aims to provide a preliminary assessment of the challenges and opportunities of co-management of a small-scale fishery in Moorea, French Polynesia under the Plan de Gestion de l’Espace Maritime (PGEM), a marine conservation plan enacted in 2004 that established marine protected areas (MPAs) in the lagoon surrounding Moorea. As my research is currently ongoing, I have not yet reached any final conclusions. This assessment is supported by findings from fieldwork conducted in July and August of 2021, predominantly consisting of 59 semi-structured interviews. Interview participants represented different stakeholder groups, including 28 fishers, three PGEM officials, nine members of the municipality of Moorea-Maiao, 12 members of district-level fishing committees, two members of the island-level PGEM steering committee, and five members of fishing and cultural associations. From its inception, the PGEM has been a point of contention as the agendas of various users of the lagoon conflict in a manner that inhibits effective participation and undermines the efficacy of the management initiative. In response to these issues, a collaborative revision process began in 2015 to devolve more decision-making power to the local community; however, recent developments concerning the ratification of the revised PGEM have generated additional concerns amongst the local community. The qualitative data highlights concerns of the lack of community representation and agency within the larger institutions involved in the PGEM, the considerable degree of apathy amongst the local community regarding the possibility for an equitable marine management framework, as well as low participation in and awareness of the PGEM revisions. While it is too soon to fully understand the extent to which the objectives of the new PGEM can be achieved, addressing the most pertinent threats to the success of meaningful co-management will be a critical first step.

223 3:20 pm

Coral Reef Restoration Practices, Methods, and Challenges In Moorea

Shannon Nelson-Maney, Anthropology (M)

Environmental conservation is at the forefront of many industries. The idea of saving or restoring a pristine environment is being pushed by politicians, scientists, tourism industries, individuals and many other large scale organizations. This is largely in part due to the so called "canary in the coal mine" of a declining environment, coral reefs. The idea of coral reef restoration has been pushed into the eyes of the public by social media, and movies such as Chasing Corals, a recent film showing the decline of the corals in the Great Barrier reef in Australia. My research is in part working to understand differing opinions surrounding coral reef restoration and conservation. Through my research I hope to discuss and understand the various different methods being proposed to restore reefs, bringing to light some of the controversies and challenges being faced by those discussing and participating in reef restoration. As I am currently about half way through my research I have yet to come to any conclusions regarding this. Moorea, the island that I am doing my research on, is an exemplary island to look at reef restoration as it has well known conservation organizations, scientists both from France and the United States, dedicated citizens, and tourists from around the world interacting with and witnessing coral reefs in crisis. Over the past summer I have conducted field work in Moorea, participating in scientific studies on coral reefs, interviewing and participating in daily activities of global conservation group the Coral Gardeners, and interviewing community members about coral reefs and what should be done to help save and protect them. My research aims to highlight and show the importance of incorporating multiple perspectives and understanding the role humans play and should play in environmental restoration as a whole, using coral reefs as a case study.

224 3:35 pm

Assessing Plastic Pollution in San Diego County’s port using satellite imagery

Aradhya Agrawal, Big Data Analytics (M)

Plastics in the natural systems have become a major concern due to their persistence in water

bodies and their adverse effects on local ecosystems. Research has shown remarkable success in plastic detection. However, only a few studies explore the root causes and pathways of plastic pollution into the sea. To investigate the mode of entry in the marine environment, it is crucial to identify the litter’s means of release, their geographic origin and where the release took place, and transport mechanisms across the marine environment. Hence, monitoring how plastic pollution enters the sea and circulates can reveal some of the pathways by which litter enters the marine environment.

The central aim of this study is to assess the feasibility of employing satellite imagery to monitor, measure, and report plastic litter accumulations along San Diego County's port landscape. Data collection included optical images and historical data (time series) from NASA/USGS LANDSAT 8.

The study's methodology includes the use of the Image and ImageChops libraries under the Pillow package in Python which can identify the differences between two images using the difference function from the ImageChops library. The metrics for calculation that can be used are percentage difference between original and new image, and Sum Squared distances. Obtained images will be cross-validated with existing imagery such spectral reflectance, thermal analysis, and indexes to confirm the presence of plastic in the catchment area.

Expected outcomes of the study include magnitude, extent, and spatio-temporal variability (including external phenomena that increase/decrease pollution concentrations, winds and currents, tourism season, maritime transport routes and schedules) of plastic pollution in San Diego County.

This research contributes to the novel and rapidly evolving stream of research on satellite technologies, revealing their relevance and role in detecting plastic pollution. It defines a replicable and flexible methodological framework for assessing the magnitude and distribution of marine pollution and studying the impacts of port activities. This analysis aims to provide a comprehensive, harmonized information on the fate of plastics to deepen understanding of their ecological impacts and enhance the management of marine resources in San Diego County ports.

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225 3:50 pm

Pollution widespread in disadvantaged communities in San Diego and Imperial County, CA: Measuring progress towards the Sustainable Development Goals

Harmit Chima, Master of Science in Big Data Analytics Program (M)

The world has committed itself to the delivery of the United Nations Sustainable Development Goals (SDGs) and accompanying targets. The SDGs are a mixture of closely intertwined social, economic, and environmental objectives; it is impossible to have sustainable social and economic development if we allow our environment to degrade. Poor air and water quality, among other environmental factors such as hazardous materials, appear to be the primary pollution burden disadvantaged communities are exposed to. In addition to the socioeconomic challenges (i.e. poverty), these populations which include minorities also experience disproportionately more health issues associated with these conditions than their more affluent counterparts.

This research spatially identifies poverty, ethnic minorities (sensitive populations), exposures and environmental effects, socioeconomic factor indicators and the health consequences that are accompanied at a neighborhood scale– examining how these challenges pose a threat to the achievement of the SDGs in urbanized San Diego County and rural Imperial County, CA through a dashboard. The quantitative dataset includes a compilation of factories from the 2021 Environmental Protection Agency's Toxic Release Inventory Program and hazardous material, pollution in multimedia (e.g. air and water), minority populations, poverty, and health disparities such as asthma, low-birth mortality and cardiovascular diseases from the California Communities Environmental Health Screening Tool 2021. The study used ArcGIS Pro to create geographic layers of each dataset and identified geospatial trends and patterns . Using the same tool, an examination of the most impacted zip codes in San Diego and Imperial County from each map layer was identified with bar graphs. Ultimately, Geographic Information Systems was employed to analyze large data sets spatially and create an interactive dashboard.

Using a blend of different spatial tools, outputs visually showcase what areas are most impacted by the factors listed above, cross-examining them to racial demographics and a few health disparities. The preliminary results demonstrated that communities near the US-Mexico international border were the most impacted by these exposure indicators.

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226 4:05 pm

The repeatability of exploratory and defensive behaviors of Southern Pacific rattlesnakes (Crotalus oreganus): do individual snakes have consistent personalities?

Ricardo Gibert, Biology (U)

Although distinct personalities are accepted in human individuals, this has not always been the case for non-domesticated animals. However, recent studies have shown that individuals within various taxonomic groups do in fact have consistent and distinct personalities, but many species and many other taxonomic groups have not been examined for these consistencies. Moreover, no significant studies examining consistent personalities have been conducted on any viperid or elapid snakes, despite their large diversity and importance in human medicine. In this study, we used twenty captive Southern Pacific rattlesnakes (Crotalus oreganus) in standardized assays to test for repeatable behaviors (i.e., personalities) between individuals. Repeatability of behaviors was tested over five repeated trials that consisted of a restraining test, an open field arena, and a defensive assay. We found six behaviors related to exploration/avoidance, activity level, and boldness/shyness that showed significant repeatability. Our analysis shows that, similar to many other species and taxonomic groups, viperidae snakes also display repeatable behaviors when tested under standardized conditions. The traits established in this study could serve as a basis for evaluating behavioral syndromes in further studies and other unexamined species.

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227 4:20 pm

The Salton Sea Crisis

Maahir Vasi, Economics (U)

In the 1900s, California engineers, while trying to divert water from the Colorado River to Imperial Valley for farming, accidently ended up flooding the Salton Basin when spring floods broke. For two years this basin filled with river water creating the Salton Sea. Farmers flocked to the area, growing a variety of crops, most famously dates. In the 50's and 60's, the Salton Sea became a tourist destination, attracting millions from all over to enjoy lake-side activities. However, the Salton Sea was a terminal lake- that is, it had no natural outflows. Coupled with limited inflows as access to the Colorado River was shut off, you had a lake that began shrinking over time. The water started to become toxic, primarily from agricultural runoff (such as DDT) and excess levels of salt, promoting algae blooms and mass fish die-offs. The once beautiful and ecologically diverse lake started becoming hostile to life, and thus started repelling people away. Over time, the lake became more and more toxic, eventually reaching a salinity level five times that of the Pacific Ocean. Today, the lake bed is littered with calcified fish bones, it reeks of sulfur, and no life is supported in the shallow sea. As the sea continues to dry up, though, and more lake bed becomes exposed, residents of Imperial and Riverside County have begun to suffer. Fast moving desert winds pick up these toxic chemicals, excess dirt, and toxic fumes, and carry them over to Riverside and Imperial. As such, these counties have been suffering from a pollution crisis. Preliminary data shows that both these counties have higher rates of asthma, mortality, cancer, and respiratory diseases as compared to other Californian counties. In this case study, both Dr. Abman and I attempt to study and quantify the economic and health damage that the Salton Sea has had on Imperial and Riverside County. We want to gain a better understanding of how this sea has negatively impacted the health and livelihoods of two often-ignored counties. We examine health statistics and rising medical costs to reach our conclusion.

Session D-2

Oral Behavioral and Social Sciences 9

Friday, March 4, 2022, 3:00 pm

Location: Pride Suite

228 3:05 pm

I Can't Feel Your Warmth: Tracing the Distance in My Father-Daughter Relationship

Shana Schoone, Communication (M)

Over the years, distance has shown itself in my romantic relationships. As I fall for people who either leave me or I run away from, I am forced to reflect on the foundational distance in my relationship with my father. I trace the distance in our relationship which worsened when my mother and father divorced when I was 16. Now, in my early 20’s I have begun to construct a version of my father that tears at the edges of my anger and mistrust. With 1,400 miles between us, each phone conversation offers an opening to see my father and our relationship as more complicated and loving than the stuck-in-the-past version I have been holding on to. Since my dad’s recent diagnosis of leukemia and the accumulated insights from our regular conversations, forgiveness flows easily and naturally and I have never felt closer to him.

Key Terms: intimacy, sadness, anger, longing, grief, distance, forgiveness, love

229 3:20 pm

“I’d Like to Be a Househusband”: What Asian American College Students Are Too Afraid to Say Because of Gender Roles

Brianna Pham, Health Communication (U)

The voices of Asian Americans may be hushed because of fear and judgment. Many Asian Americans struggle to maintain the identities that are rooted in their home country as they respond to pressure to conform to American norms in order to fit in. Although it is crucial to acknowledge different cultural ideals, there are some problematic traditions and cultural norms that remain. One primary example is the power of gender roles, which describe the societal expectations for men and women. In this study, I use Feminist Theories to explain how perceptions of gender roles have been cultivated and continue to persist throughout generations. The research emphasizes the detrimental effects of oppression, patriarchy, stereotyping, discrimination, and objectification of women, which have influenced society’s constructions of masculinity and femininity.

This qualitative research study draws on in-depth interviewing to explore how Asian American college students shape their identity based on the gendered roles and expectations they experience. Participants included five Asian American college students of Vietnamese, Filipino, Japanese, Chinese, and Korean descent. Interview questions focused on participants’ gender knowledge and experiences, family upbringing, and personal reflections.

Upon the completion of qualitative analysis, various themes emerged. First, toxic masculinity caused Asian American men to refrain from expressing their emotions. Participants struggled with gendered roles and responsibilities of being the breadwinner, including pressure to acquire a high-paying job rather than pursuing their true interests. Collectivistic values were identified by the participants because having outlying traits that the family does not approve of, such as being an outspoken woman, can create a negative connotation to the family’s image. Because of the values of respecting elders, participants encountered an unspoken rule that one cannot object to them in any way. Relating to misogyny, women felt restricted in their ability to fully express themselves without being judged as ill-mannered or attention-seeking. Overall, there are traditional gender roles that have managed to carry on through generations of the Asian culture and it has been seen as harmful towards the identities of Asian American college students.

230 3:35 pm

All Gays Go to Heaven

Julia Lyell, Health Communication (U)

This qualitative study explores the ways that queer people call on (consciously or unconsciously) the values and lessons they learned through their religious affiliations while coming out. The study analyzes coming out experiences through the lens of queer narratives. To collect data for this research study, the author conducted in-depth qualitative interviews with three participants. Participants responded to 14 questions that addressed religious affiliation and sexual identity. Each interview was between 45 minutes and 77 minutes long. Data coded and organized from the interviews highlighted the ways that internalized institutional discourse manifests in three phases of coming out: pre-coming out, coming out, and living out. While each participant varied in their level of religious affiliation and belief, all of them had their internalized religious discourse reinforced when they came out. The living out phase is categorized as the present or modified understanding of sexuality and spirituality that participants crafted as they settled into their complete identities. The author concluded that while internalized institutional discourse can lead to feelings of shame and fear, living authentically is worth the plight of coming out. The author hopes their research opens doors to understanding, healing, acceptance, and the celebration and joy that all love deserves.

Keywords: Sexuality, queer theory, qualitative interviews

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231 3:50 pm

An Exploratory Factor Analysis of an Adapted Socialization and Support Questionnaire for High School Gender and Sexuality Alliance (GSA) Youth Members

Linda Salgin, Public Health (D)

Background: Gender and Sexuality Alliances (GSAs) are youth-led, adult-advised clubs in middle and high schools that unite and build communities between sexual and gender minority youth (SGMY) and allied youth. GSAs typically serve four main functions 1) Information & Resources, 2) Socialization, 3) Support and 4) Advocacy. Socialization and support have shown to be connected to lower rates of anxiety and depression, healthy development, positive well-being and hope. However, there is little consensus on how socialization and support are measured in the context of GSAs and SGMY. The current study builds upon the work of Poteat et al. (2016), by conducting two exploratory factor analyses on scales measuring socializing and support in two datasets of SGMY GSA members.

Methods: Study 1 conducted an exploratory factor analysis (EFA) on a 17-item index assessing socialization and support, information and resources, and advocacy among 594 SGMY GSA members across 42 public, private and charter high schools in Massachusetts. Study 2 conducted a second exploratory factor analysis on an SGMY-adapted 11-item socialization and support index that derived from the 17-item index among 258 high school GSA members across 28 GSAs in Massachusetts, New York City, and San Diego.

Results: The EFA for study 1 resulted in a three-factor structure which explained 61.43% of the total variance. The factor structure mirrored the original analysis (Poteat et al., 2016), among half the study population, confirming a seven-item support/socializing scale, a seven-item advocacy scale, and a three-item information/resource scale. For study 2, an EFA indicated that socialization and support loaded onto a single factor which explained 57.25% of the variance. Internal reliability was high, $\alpha = .92$.

Discussion: Despite evidence demonstrating that support has multiple forms which include socialization, and thus these two constructs may be better suited together, existing scales that measure socialization and support have done so separately. Our analysis indicates that socialization and support, in the context of SGMY in GSAs, may be better evaluated as a unidimensional construct.

232 4:05 pm

My Anger is Still a Small Boy: (Dis)embodied Anger as Survival

Damon Lawson, Communication Studies (M)

Often considered a part of the dark side of communication, anger is typically regarded with a highly negative connotation. This paper examines the ways that personal experiences with anger have manifested into tactics of survival for highly traumatic situations and environments. Through (dis)embodiment and narrative personification, I come to an intimate knowledge of varying orientations of anger and the role they play in my continued survival. Each character, Rage, Resilience, Revenge, and Recovery, offers a unique insight to how anger can be understood as a central force of protection, growth, and healing.

Keywords: Anger, Aggression, Autoethnography, Trauma, Survival, LGBTQ.

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233 4:20 pm

Why Does Autoethnographic Research Matter? Developing a Meta-Counterstory from Students' Voices

Reychel Robles, English Single Subject Teaching (U)

This research demonstrates the value autoethnography has to "debunk" the dominant narrative of being an underrepresented first-generation college student in higher education. Motivation for this study arose because four of my colleagues and I experienced inequity with our autoethnographies at the 2021 online Student Research Symposium (SRS). Judges came unprepared and uncredited our experiences, sending a message that autoethnography is not serious research. Autoethnography's a process and a product of researching and writing that seeks to systematically describe and analyze personal experiences to understand cultural experiences (Ellis et al., 2011). This approach challenges canonical ways of doing research and representing others as a political, socially-just, and socially-conscious act in a collective counterstory that "challenge[s], displace[s], or mock[s]... pernicious narratives and beliefs" of the dominant culture (Delgado and Stefanic, 2012, p. 43) I start as an undergraduate autoethnographic presenter in SRS 2021, turned activist challenging fairness from San Diego

State University's (SDSU) practices assessing student research. Then, I'm a participant in 2019's Health Careers Opportunity Program (HCOP) summer seminar, first learning about qualitative research. Lastly, as an independent undergraduate scholar, I have chosen a representational research analysis approach (Creswell & Poth, 2018, p.199) to identify the principal themes across 13 of 15 undergraduate autoethnographies including my own from the 2019 inaugural summer seminar of SDSU's HCOP. For this exploratory study, I analyzed seven of 13 selected authentic autoethnographies with the following content analysis: 1) Reading and memoing emergent ideas. 2) Holistic classifying codes into themes. 3) The unit of analysis was the paragraph as delineated by formatting conventions. Word count was calculated for each paragraph and a statistical formula was used to render the word count of the paragraphs roughly equivalent so there were no very large or very small paragraphs in the clean data set. 4) Hand coding preceded the use of NVivo to identify themes that were common across all autoethnographies. 5) Using the results of NVivo, representing and visualizing the data to form a meta-counterstory that has potential for generalizability to other institutions and programs similar to SDSU and HCOP.

Session D-3

Oral Biological and Agricultural Sciences 4

Friday, March 4, 2022, 3:00 pm

Location: Park Boulevard

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234 3:05 pm

Cigarettes and Marine Systems: Exploring the Bioaccumulative Effects of Tobacco Waste on the Marine Bioindicator Species, Macoma nasuta

Jordan Alejo, Public Health with a Concentration in Environmental Health (M)

Cigarette filters or "butts" are one of the most abundant litters found in the ocean today. According to the 2020 International Coastal Cleanup Report published by the Ocean Conservancy, cigarette butts are the second most picked up litter type worldwide behind plastic wrappers. Cigarette filters are made from cellulose acetate, a synthetic fiber that can persist in aquatic environments up to 18 months. These filters hold onto toxic constituents associated with tobacco smoke. As cigarette butts persist in the environment, these chemicals leach into ecosystems and expose biota to their harmful effects. Previous studies have demonstrated that cigarette butt leachate has the potential to cause acute and chronic toxicity in aquatic organisms. However, the bioaccumulative effects of tobacco chemicals on marine organisms and the possible biomagnification up food chains, have seldom been studied.

Bent-nose clams, Macoma nasuta, are a marine species and are common in California natural reserves. California natural reserves are currently being assessed for the impacts of cigarette butts, as many are in close proximity to heavily urbanized areas, and therefore may be disproportionality impacted by leached cigarette compounds. Using a standard 28-day bioaccumulation bioassay, the bioaccumulation potential of cigarette compounds was assessed in the test species Macoma nasuta. Clams were exposed to 1.0 cigarette butt/L leachate over the course of 28 days. At the end of the 28 days, the clams entered a depuration period, then promptly shucked and tissue samples were extracted. A nontargeted analysis (GC×GC/TOF-MS) was conducted on the tissue. There was no significant evidence that cigarette leachate exposure affected clam mortalities or weights, however, noticeable changes in clam burrowing behavior were noted. A total of 282 unique compounds were identified in the clams exposed to cigarette leachate. 41 compounds were categorized as "highly identifiable," composing 21.1% of the total peak area. Multiple compounds associated with cigarette smoke were identified in the tissue – such as nicotine, 4,4-bipyridine, and cotinine. This study suggests that cigarette butt leachate chemicals have the propensity to bioaccumulate in the tissue of marine organisms and may result in eventual human exposure up the food chain.

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235 3:20 pm

Using functional traits to understand how the habitat structure of eelgrass (Zostera marina) affects the community of animals living within it

Karl Koehler, Biology (M)

Eelgrass (Zostera marina) is a marine plant that plays an outsized role in the health and resiliency of coastal ecosystems. The health of eelgrass depends on facilitative relationships with a community of epifaunal animals found living on its leaves. The successful preservation and restoration of all habitats, including eelgrass, would be bolstered by a greater understanding of how the physical structure of a habitat affects its inhabitants. In an effort to illuminate such patterns I collected 119 samples of the epifaunal community of eelgrass (including over 70,000 individuals from more than 90 species) along with paired measurements of numerous aspects of habitat structure. Univariate measures of community structure that most studies use (like diversity and abundance) failed to display significant correlations with habitat structure because they are too broad to capture the varied ways which species interact with different aspects of a habitat. To dissect the complexity of variable species responses, I created a model of the relative abundance of organisms with shared functional traits such as size, diet, or brooded vs planktonic larvae as a function of ecological variables like the size and density of eelgrass patches. Functional groups provide a more ecologically relevant response variable because these traits often mediate an organism's response to its surroundings and because they cumulatively convey the diversity of roles and interactions represented within a community. The patterns I observed will aid in future research design, promote more successful eelgrass management, and shed light on persistent ecological questions about how habitat structure shapes animal communities in general.

236 3:35 pm

The effect of temperature increase on Panulirus interruptus metabolism and predation behavior

Vanessa Van Deusen, Biology (M)

Ocean warming affects the physiology and behavior of marine organisms, which can alter the nature of species interactions. Increasing temperature accelerates biological reactions including metabolism. In response, organisms consume more calories to maintain basal function, which may alter predator-prey relationships. We tested the effects of water temperature on the energy demand and predation behavior of the California spiny lobster Panulirus interruptus, an important predator of sea urchins in Pacific kelp forests. Using respiration chambers and laboratory mesocosms, we tested for differences in lobster metabolism, functional response to urchin density, and prey choice between present-day temperature (14˚C) and temperatures observed during marine heat waves and expected with future warming (18˚C). Lobsters ate more urchins at 18˚C than at 14˚C, which is consistent with the increase in metabolic rate we observed at higher temperatures. We found no differences in prey size selection between 14˚C and 18˚C. Lobsters exhibited a non-regulatory type II functional response to urchin density at both temperatures. Ocean warming will likely increase spiny lobster's predation on purple urchins, causing lobsters to consume more prey items to satisfy an increased caloric demand.

237 3:50 pm

Germination Viability Based on Seed Depth of the Invasive Shrub Genista monosperma

Emily Marusin, Biology (U)

In 1991, an invasive species of legume eventually identified as Genista monosperma (common name: Bridal Broom), was detected on US Navy property in Fallbrook, California. Because of concerns that the plant would spread and conflict with wildfire risk management programs, G. monosperma eradication treatments began in 1996. Large shrubs were cut, and stem and branch wood were left as debris piles that remain to this day. Herbicide was applied to the remaining stumps. These treatments stopped in 1997, but every year since new seedlings were found in the debris pile sites. It is therefore speculated that these seedlings originated from the shrubs that were cut down in 1996. In order to achieve the overall goal of eradicating G. monosperma from the Fallbrook property, Navy managers require detailed information on the existing seed bank and its germination potential.

This study's purpose is to determine the viable germination period of G. monosperma once the seed source (i.e., living plants) is removed. In particular we will: a) assess seed viability in the seed bank from the surrounding debris pile soil, and b) determine if there is a germination depth limit for viable seeds.

Seeds of unknown age were collected from one Fallbrook debris pile at 18 sample locations and 3 depths per location. We will test for seed viability as a function of source depth. Then germination success will be evaluated for seeds from shallow (0-5 cm) and deep (5-15cm) soils, comparing manually scarified, heat-treated, and control seeds. To examine germination depth, we will plant seeds in soil at depths from 0-20cm deep and record successful emergence of cotyledons above the soil surface. Results from these experiments will provide information to better understand the threat posed by the existing G. monosperma seed bank and thereby aid the development of successful eradication programs.

238 4:05 pm

The dismal future of pinyon woodlands in the Southwest

Ryan Buck, Evolutionary Biology (D)

The two-needled pinyon pine (Pinus edulis) is a dominant species in the Southwestern US and a barometer of climate change. It has recently experienced some of the highest mortality rates among forest species after prolonged periods of drought, which are expected to increase in intensity with climate change. Previous niche modeling studies suggest the distribution of P. edulis will significantly decrease by 2100. Pinus edulis is a foundation species, supporting thousands of other species above and below ground, so its mass mortality could have profound impacts on the ecosystem it inhabits. Little is known about the future of the four other taxa it hybridizes with (P. californiarum, P. quadrifolia, P. monophylla, and P. x fallax), which have smaller ranges and thus may be equally or more affected by climate change. In this study, we examined the current habitat suitability for each species, then projected the future habitat suitability under three different climate change scenarios that vary in degree of intensity. We hypothesize that all species will have less overall suitable habitat under all climate scenarios, with some of the more restricted species such as P. californiarum, P. quadrifolia, and P. x fallax disappearing completely. We first used genetic and morphological data to identify species' distributions across the Southwestern US and Baja California. Next, we used citizen science observation points and our own collection points as species' presence data, combined with 19 current and future bioclimatic variables from WorldClim, 36 soil classes, 8 slope classes, and 5 slope aspect classes from the Harmonized Soil Database to inform the niche models in Maxent. Our results support the previous studies' predictions of P. edulis habitat loss by 2070 and actually demonstrate a more intense habitat shift. All other species also show a loss in current suitable habitat, with some showing an increase in habitat suitability in higher latitudes. Conservation efforts will need to incorporate the predicted future habitat of susceptible species in order to effectively manage and save species from climate change.

239 4:20 pm

Cylindropuntia wolfii's regeneration and climatic change implications

Mia Almanza, Environmental Sciences (U)

Cylindropuntia wolfii is a species of cactus endemic to Southern California and Northern Baja California. All records of C. wolfii North of the border are located within the Sonoran desert, both in San Diego and Imperial counties. Although this cactus shrub is of very limited distribution, it is relatively abundant within its range and serves as a food source and shelter for many species, including pollinators, and possibly mammals. Cactaceae (cactus plants) is one of the most representative plant groups of the arid and semi-arid areas of the Americas, and it is the fifth most threatened group of species (Goettsch et al. 2015). The region in which C. wolfii thrives is one of the most arid regions in the world, making it a species well adapted to a hot and dry climate. However, our observations indicate it is struggling to reproduce sexually. Thus, understanding whether it can reproduce clonally is important to understand its ability to survive in extreme conditions. Projected climate change may be a stressor to C. wolfii and surrounding species with the region continuing to get hotter and drier, which is why it would be interesting to project the possible future climatic conditions for the study area, and eventually determine the effects it may have on the species distribution. The goal of this research is to assess the seed production and regeneration of C. wolfii, as well as determine future climate projections in the region in which it grows to better understand the impact of climate change on C. wolfii and its distribution. The regeneration of the species will be assessed by scouting for baby plants, as well as dropped segments that can potentially lead to asexual reproduction. As to projected climate changes for the Sonoran desert, a climate model will be created using the R studio computer program for projected temperature, and precipitation changes. Other climate models that have projected changes for the region of interest will be taken into account for this research.

Session D-4

Oral Humanities, History, Literature, Philosophy 4
Friday, March 4, 2022, 3:00 pm
Location: Mata'yuum

240 3:05 pm

The World’s First Attempt at Monotheism? A Closer Look at Akhenaten’s Religious Reforms

Christine Jacobites, History (M)

Pharaoh Akhenaten ruled over Egypt from approximately 1353 BCE to 1336 BCE during the New Kingdom with a relatively peaceful reign. For thousands of years, the Egyptian Parthenon featured hundreds of gods and goddesses, often incorporating new ones as the country expanded or traders brought new ideas. The head of the Parthenon was the god Amun-Re, to whom temples were dedicated throughout the country, but Thebes was his dedicated city and boosted the largest and richest of all temples. Besides vast riches and large resources given to Amun-Re, his temples also employed very large numbers of priests. During his reign, Akhenaten elevated the sun god, Aten to become the chief god, and moved the capital out of Thebes, thus diminishing the power of the priests of Amun-Re. Akhenaten was born Amenhotep IV and his name meant Amun is satisfied. But when Akhenaten endorsed the worship of Aten, he changed his name to Akhenaten which meant the spirit or light of Aten. The accepted modern credence is that this was the world’s first attempt at monotheism. After a closer look at the evidence left behind, however, it is clear that this was not an attempt at monotheism. The idea of monotheism would have been alien and foreign to Akhenaten and was not his goal. At best Akhenaten’s decision in worshipping Aten could be described as henotheism, the worship of one god while not denying the existence of others, but the evidence does not support a claim of monotheism. Akhenaten did not try and spread the worship of Aten to his peoples or outside Egypt. Inscriptional and papyrological evidence suggests that while Akhenaten seemed to have solely worshipped Aten, he allowed his peoples to continue to worship all the gods and goddesses as they had for thousands of years. This negates any claims of a monotheistic attempt by Akhenaten.

241 3:20 pm

Marie-Antoinette and Moral Conspiracy

Daniel Fazziola, History (U)

The French Revolution from 1774-1792 set its sights on taking down King Louis XVI and Queen Marie-Antoinette, yet Marie-Antoinette became the center of many conspiracies that accused her of being a traitor, manipulator, having incestual relations, and a multitude of other accusations. What made pamphlets the popular and preferred method of attacking the royal family? How was it that so many people were ready to accept the accusations against Marie-Antoinette? Elements that contributed to growing conspiracies about Marie-Antoinette were a deep-rooted patriarchal system established popularly by French philosopher Rousseau and others would gradually establish the idea that the king and queen were seen as parental authority figures. These combined elements created a popular sentiment that women, including the queen were to follow these socially set rules and any deviation resulted in the following conspiracies, rumors and explicit pornographic material being circulated using Marie-Antoinette as an example to women who considered similar paths as the former queen. The images produced depicting Marie-Antoinette would become known as political pornography, a tool that would be used with excess against the foreign queen.

242 3:35 pm

News from Mexico: How Newspapers from Across the World Covered the Second French Intervention in Mexico

Cesar Cabrera Cazarez, History (M)

By June 1867, the French had withdrawn from Mexico and the emperor of the Second Mexican Empire, Maximilian I, had been captured by the Republican forces after a long siege in the city of Queretaro. This paper analyzes how newspapers from across the world - Mexico, France, United States, United Kingdom, just to name a few - and different viewpoints - liberals, conservatives, Union, and Confederates - covered the execution of Maximilian I and the defeat of the Mexican Conservatives and the French in their Second Intervention in Mexico. Comparing each newspaper’s approach, content, and context reveals the reasons for their unique coverage of Mexico's war. This approach sheds light not only on the Second French Intervention in Mexico, but also on the mindset the people and newspapers had during this time period. Some of the secondary sources (academic works) include Patria 3 (2017) by Paco Ignacio Taibo II, Peasant and Nation: The Making of Postcolonial Mexico and Peru (1995) by Dr. Florencia Mallon, Mexican Politics During the Juarez Regime, 1855-1872 (1956) by Dr. Walter Scholes, among others. I will analyze the approach of these historians with their secondary sources, and compare them with my own approach and analysis of the sources. The purpose of this is to show the differences within the historiography of this topic, and how this thesis would add to it.

243 3:50 pm

Soured on the American Diet: Immigrant Resistance to Assimilation

Cassandra Onstad, History (M)

In Foods of the Foreign-Born in relation to Health (1922), Bertha M. Woods, a dietician at the Boston Dispensary Food Clinic, claimed that "excessive use of pickled foods destroy[ed] the taste for milder flavors, cause[ed] irritation, and render[ed] assimilation more difficult." Woods was not the only Progressive reformer to claim immigrants' diet impeded their success and assimilation into American society. While previous historians have detailed middle-class reformers' views of food and diet, my research focuses on immigrant narratives to examine the intersections of gender, generational differences, and economic status in immigrants' resistance to Progressive reform. Using autobiographies, published accounts, and photos, I argue that middle-class reformers failed to reach their goal of transforming immigrants' diets because they did not engage with or understand the importance of immigrants' multi-ethnic culinary traditions. Immigrant children, however, as liminal characters in between two cultures, were more open to Progressive culinary instruction and assimilation through food reform.

244 4:05 pm

Who He Is: The Trials, Tribulations and Triumphs of David Ruffin's Post-Temptation Career

Maximus Mieser, History (U)

Reaching the end of a musically charged decade, the critically acclaimed R&B "Emperors of Soul" known as the Temptations, established their reputation as a powerhouse Motown act, becoming the label's most successful male group by 1969. With the passionate performance of member David Ruffin on several of their hits from "My Girl", "Ain't Too Proud to Beg" to "I Know I'm Losing You", the singers propelled to stardom in a matter of five years, part and parcel to Ruffin's musical capabilities and popularity. However, the seemingly positive direction of Ruffin's career took a turn for the worse as he was unanimously dismissed from the group in 1969, releasing one solo hit at the end of the decade before subsequent commercial failures in his work, marking the fall of his career according to historians and music critics. The goal of this research is to underscore certain perceptions of masculinity and manhood from the 1960's through the 1970's as reflected in Ruffin's post-Temptation career, personal and musical maturation by analyzing the historiography, discography, performances, documentaries and interviews of his life's work. Furthermore, this presentation argues that Ruffin's career following the 1960's is equally significant to his work with the Temptations as the deeper implications of his inner-conflict provide a microcosm of how generational violence and abuse are perpetuated. Ruffin's own childhood, mired with physical and sexual abuse, sets a precedence for his drug addiction and physical abuse later on, forcing him to seek introspection on manhood, redemption for his actions and purpose in his life upon losing stardom in an era of changing gender perceptions.

245 4:20 pm

Spreading the Love: Comparing the 1986 Nonviolent Revolution in the Philippines to the 1989 Velvet Revolutions in Eastern Europe

Pamela deVega, History and Political Science (U)

From Europe to Sub-Saharan Africa and Asia to Latin America, the 1980s and 1990s bore witness to a global trend toward democracy through nonviolent means. While the links between these various revolutions were not thoroughly examined in their immediate aftermath, recent scholarship has developed and demonstrated connections between several key democratization efforts. Chief among these is the 1986 People Power Movement in the Philippines against dictator Ferdinand Marcos and the 1989 so-called Velvet Revolutions in Eastern Europe, namely Czechoslovakia and East Germany. This presentation explores linkages between these three movements. It highlights the necessity of parallel institutions in ensuring a successful revolution for all three locations. These parallel institutions include the church, the media, and the military, all of which supported or aided in varying ways the nonviolent demonstrations in their respective countries. The justification of my claims derives from my analysis of primary and secondary sources, including newspapers, interviews with participants in these movements and other firsthand accounts, and US State Department records from the 1980s and 1990s. Decentered and non-Eurocentric perspectives are vital in forming these connections because they give more agency to the Philippines than other sources. My research concludes that there is a notable connection between the 1986 nonviolent revolution in the Philippines and the 1989 Velvet Revolutions in Eastern Europe, with the Philippines serving as inspiration for succeeding revolutions that also relied on parallel institutions to achieve democracy.

Session D-5

Oral Engineering and Computer Science 4

Friday, March 4, 2022, 3:00 pm

Location: Aztlan

246 3:05 pm

"#iorestoacasa": Twitter and the 2020 COVID-19 Pandemic in Milan, Italy. A Temporal and Translation Comparison

Karenina Nicoli Zaballa, Big Data Analytics (M)

In 2020, the Italian city of Milan became one of the first epicenters of COVID-19 outside of Asia. Its decision-makers were ill-prepared in managing the outbreak. This research conducted content analysis of geotagged tweets in Milan during the government-enforced lockdown in March 2020 and after the lockdown in May 2020. It provides a temporal and translational comparison of over 545,000 Italian language tweets and their English translation.

The Italian tweets were harvested using Italian and English keywords. The translation tool deepL was used to translate all Italian tweets into English. Three methods were used for the temporal and translational comparisons: word clouds and frequency tables, pointwise mutual information (PMI) score, and Latent Dirichlet Allocation (LDA) topic models.

The temporal comparison reveals that tweets during the lockdown in March 2020 (Phase I) focused more on the containment of the virus and the disruption on daily routine, like soccer events and gatherings. When the lockdown was lifted in May 2020 (Phase II), the themes included testing, origin, vaccines, possible treatments for COVID-19, political criticism on pandemic management, and unsafe public health behavior.

The translation comparison revealed that translation mistakes can make or break communication and understanding during high-stakes situations like the pandemic. It showed contextual mistranslations, mistranslations due to encoding, gender errors, and possible machine learning model errors that can be improved over time.

By combining both the temporal and translational analysis, this work hopes to help local leaders in managing future pandemics and other healthcare crises from a multilingual perspective.

247 3:20 pm

Uber-inspired Quality of Experience driven Pricing Model for 6G Wireless Multimedia Communications

Krishna Murthy Kattiyan Ramamoorthy, Computational Science (D)

Non-Orthogonal Multiple Access (NOMA) has been a hot research topic since it has been advocated as a promising network access technique for 6G cellular networks and beyond. In comparison to Orthogonal Frequency Division Multiple Access (OFDMA), which is the current de facto standard for network access; NOMA provides a set of desirable potential benefits, such as improved spectrum efficiency, enhanced connectivity, and reduced latency with high reliability. The fundamental philosophy of NOMA is to cater multiple users simultaneously using the same resource block spanning across time, frequency, and space. This would dramatically improve the network capacity as each base station could support hundreds of more users concurrently.

However, there are several implementation challenges lying ahead in terms of optimal power allocation among users, resource block allotment and strategic pricing. These issues are addressed in this research by introducing a novel Uber-inspired pricing technique called NOMA Pricing. Since multiple users can be supported on a single resource block; users may prefer one block (due to lower latency or higher throughput) over the other when the price is uniform. To address this, NOMAP architecture allows the base station to dynamically price the resource blocks based on noise, interference, and the available power. The users have a free choice to choose the resource block that yields best utility. This is comparable to the Uber's model where users are provided with multiple options such as Uber pool, UberX, Uber Comfort and Uber Select. All the rides serve the purpose of getting the user to the destination, however with different quality of experience.

The efficacy of the proposed pricing model was evaluated over a simulated network with a single base station and numerous resource blocks. The utility maximization interplay between the user and service provider was translated into a Game theoretic problem and several game theoretic methodologies were leveraged to derive optimal solution. The results hint that the proposed pricing model significantly outperforms the merits of traditional uniform pricing schemes for both user and service provider.

248 3:35 pm

Can Machine Learning Be Used for Determining Interaction Between 2D & 3D Materials for Novel Semi-Conductor Devices

James Bunnell, Computer Engineering (U)

Machine learning is a quickly developing discipline with applications in every field of research and commercial products. In our lab, we create microelectrode arrays that use electrochemical reactions to detect chemical neurotransmitters in the brain linked to neurological disorders. Our team set out to utilize the power of machine learning to predict the electrochemical properties of microelectrodes created from new two-dimensional materials combined with current three-dimensional materials. The choice to explore the combination of 2D materials and 3D materials came from wanting to combine the charge capacity of 3D materials with the high conductivity characteristic of 2D materials. The research contains four stages; the Data Engineering stage using unsupervised learn and material databases, a molecular dynamics simulation stage using ReaxFF, a supervised learning stage that trains the final model, and the final stage using the trained model to make predictions with more combinations materials.

Stage one is the data ingress and material combination selection which parses 2D and 3D material databases. We use unsupervised learning clustering algorithms to find groups of materials that would react and then select combinations to move onto stage two. Stage two is the simulation step which takes the combinations of materials from stage one and simulates the electrode in the molecular dynamics software ReaxFF and results in electrical properties of the electrode. Stage three inputs from the stage one combination selection and stage two simulation results to train a supervised learning model. Then finally, we make predictions on combinations we have not simulated and determine if the results warrant further simulation.

At the end of our research, we intend to discover a better microelectrode that can effectively detect the presence and concentration of neurotransmitters. Our framework could evolve to tackle other design choices that have many possibilities in any other micro-electrical-mechanical system.

249 3:50 pm

Co-Robots Motion Planning in Crowds

Yu Chou, Computer Science (M)

Co-robots are robots that cooperate with their human partners to accomplish a task. For co-robots to have a widespread use, they must co-exist and operate safely in human dominated natural environments without colliding with anyone or any obstacle. This requires the co-robots to visually detect people using cameras or other sensors and plan its own path with a new level of intelligence. This research proposes a visual based solution using a Bayesian classifier to predict people's motion and using a genetic algorithm to plan the path of the co-robot in a crowd while fulfilling the two major tasks—maintaining proper distance from the human partner and people in the field of view while also following the human partner. A three-dimensional model with a two-dimensional plane and one-dimensional time is used for the modeling. The information about the crowd was obtained through video and image sequence. A Bayesian based motion prediction algorithm was implemented for the prediction of people movements, based on which an optimal path for the co-robot was determined using a genetic algorithm. A Windows Presentation Foundation (WPF) application software system was developed to test the implemented solution in four different test environments—no obstacle, static obstacle, moving pedestrian, and real scene simulation. The optimal co-robot paths from the genetic algorithm were recorded, analyzed, and displayed in animation in the WPF application. The results showed that this solution is highly effective in fulfilling the tasks of partner-following (scores 97%-99%) and human collision avoidance (93%-99%). They also showed that the solution is effective in avoiding static obstacle (74%-86%) and keeping comfortable distance from the people in the scene (72%-98%). Overall, the results showed that this hybrid solution using Bayesian based motion prediction and genetic path planning can be an effective solution for co-robot path planning problem.

Session D-6

Oral Business Economics and Public Administration / Education 2

Friday, March 4, 2022, 3:00 pm

Location: Metzli

250 3:05 pm

Types of Undergraduate Research Experiences in Chemistry and Biochemistry: A Qualitative Case Study Analysis of Influencing Agents

Sharai Mendez, Chemistry (M)

Research has shown that Undergraduate Research Experiences (UREs) are crucial for student persistence in STEM. Previously, less comprehensive value has been placed on the individual factors affecting undergraduate students joining and persisting in UREs. Social influence theory describes these factors as influencing agents, which can be representatives from the academic community (such as instructors or fellow students), as well as contextual variables (such as journal articles or research posters). These influencing agents have been shown to impact students' sense of belonging, experiences of stereotype threat, and their intentions to participate in academic community activities. Social psychologists have shown that the variability and frequent occurrence of social influence is ubiquitous, but not much is known about social influence in relation to UREs.

In the present study, qualitative data was collected through interviews with individuals who participated in UREs in the Chemistry & Biochemistry department of a large research-oriented Hispanic-Serving Institution. Additional data included open-ended responses to the Undergraduate Research Student Self-Assessment (URSSA) survey. Qualitative analysis via a priori coding and grounded theory was used to characterize influencing agents of UREs. Identified influencing agents include academic individuals (i.e. principal investigator, instructors, and fellow students), as well as research context factors (i.e. research focus and work environment). Influencing agents were found to impact interest and persistence, advertently or inadvertently affecting the research experience. Influencing agents in this study are illustrated and defined through case studies of individuals with meritorious UREs. Observing UREs in STEM through the perspective lens of social influences can give insight into student persistence in undergraduate research and identify the variables which help foster positive laboratory experiences allowing for the design of more positive UREs.

251 3:20 pm

STEM Experiential Learning at Hispanic Serving Institutions: Latinx Servingness

Rosa Tejeda, Post-Secondary Educational Leadership Student Affairs (M)

Hispanic-Serving Institutions (HSIs) and community colleges (CC) are vital to the STEM pathways of underrepresented students, including Latinx students (Herrera & Rodriguez-Operana, 2020). In addition, previous studies have demonstrated that experiential learning (EL) plays an important role in STEM student success in higher education (Brown et al., 2020; Rodriguez Amaya et al., 2018). EL is a way of learning outside of the classroom, including undergraduate research and work-based experiences. While the research on HSI "servingness" or the ways in which these institutions meet the needs of Latinx students continues to grow (Garcia et al., 2019), more research is needed to understand STEM-specific efforts within HSIs and the role of EL in supporting students. The purpose of this literature review is to understand HSI servingness within STEM EL programs and courses, and more specifically, how STEM EL helps meet the needs of Latinx and other underrepresented students in STEM at HSIs.

Multiple databases were used to conduct our literature review, including EBSCO, OneSearch, and Google Scholar. We used the following keywords for our search: STEM, experiential learning, undergraduate research experiences, work-based experiences, internships, Hispanic-Serving Institutions (HSIs), and community colleges. To help us organize our sources, we utilized Zotero, a reference management software. NVivo, a qualitative data analysis software, will be used to help us develop a conceptual map based on our review of the literature.

Key findings from the literature illustrate the importance of STEM EL opportunities and programs, especially for Latinx and other underrepresented students in STEM attending HSIs and CCs. STEM EL, including undergraduate research experiences (e.g.,, programs and course-based undergraduate research experiences) and work-based experiences (e.g., internships and course-based work-integrated learning), provide opportunities for students to network with STEM peers, faculty, and professionals, and connect them with mentors. STEM EL also offers opportunities for students to develop skills helpful for research and future employment in the STEM industry. Undergraduate participation in STEM EL at HSIs is associated with both positive academic and non-academic outcomes. Further findings from the literature review regarding HSI servingness in STEM EL will be discussed.

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252 3:35 pm

Visualizing Black Multilinguals

Reka Barton, Education (D)

Black girl magic, commonly referred to across social media platforms as #blackgirlmagic, was coined in 2013 by Cashawn Thomas to highlight and center the positivity and success of Black women. What started as a hashtag and a mantra for her circle of women has now become a global phenomenon and viral social media presence. The pervasiveness of this #Blackgirlmagic appears in every genre and generation, and has yet to be fully defined or realized. We know that Black girls exude this power, as there are millions of representations of it, yet this #blackgirlmagic is commonly stifled in society as well as the education sector. Whether it's the multilingual prominence of Black people globally, or the creative linguistic nature that Black people exude, there has always been and will always be, magic in our language, and the way we use it. As we continue to define diversity, equity, and student achievement in the TK-12 realm, and look for solutions to dismantle inequitable educational realities of the past, we should implement the possibility of Dual Language Spanish/English programs as a vehicle for equity and achievement for Black girls. Right now, in over 35 states, more than 2000 dual language programs exist, with the majority of programs using Spanish and English as their target languages (Ed Week, 2020). Since the passing of Prop 58 in California in 2017, the amount of dual language programs that exist in the state has grown tremendously. Due to this false binary, Black students, especially Black girls have been unwritten in this growing narrative of educationally equitable schooling. Evans-Winters (2014) centers the question, "what resources are available to gifted Black girls that might prevent underachievement and promote high academic achievement?". What if dual language programming could answer that call? What if dual language programming could be a collective space of freedom, a hopescape, an affirming act of literacy (Brown, 2017, Price-Dennis et al., 2017), and a space of Black girls' futuremaking (Turner & Griffin, 2020)? This research seeks to acknowledge the underrepresentation and marginalization of Black girls in dual language education, while simultaneously centering their brilliance.

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253 3:50 pm

An Imperial Valley student's testimonio: Experiences from a satellite campus

Alan Castro, Psychology (U)

This paper explores my experiences as a latino first generation transfer student from the borderlands of southern California at San Diego State University Imperial Valley through my own testimonio. The purpose is to explore the educational inequalities in the Imperial Valley campus compared to the SDSU West campus and how it has affected my own educational trajectory. This paper will explore the challenges I've faced through my college experiences using a testimonio to shed light on issues that students face from an alienated and rural satellite campus environment.

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254 4:05 pm

The Role of Undergraduate Research in Fostering Scholar Identities among Latina/o/x Community College Students

Lawson Hardrick III, Postsecondary Educational Leadership and Student Affairs (M)

The presenters will share insights into the development and facilitation of a virtual six-week summer undergraduate research (UR) program that introduced Latina/o/x community college students to social science research. The program underscored the significance of establishing partnerships across two- and four-year institutions to promote UR for community college students BEFORE transferring. The presenters will discuss funding, the program curriculum, and the mentoring model.

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255 4:20 pm

"What does it mean to be a anti-racist science educator and what does it look like?": A Cross-Case Study on Teacher Candidates' Anti-Racist Science Teaching Conceptualizations

Lucyann Atkins, Child And Family Development (U)

As our nation struggles to heal from the ongoing COVID-19 pandemic, this pandemic is a challenge that not only imposes issues for our society but serves as an example of systematic racism within the field of science. Although COVID-19 has affected many people, racially minoritized groups and low SES populations are among those who are most negatively impacted. And while many struggle to stay afloat and survive throughout this pandemic, other groups, such as the wealthiest white men, reap the benefits and profits. Systematic racism is not only apparent and alarmingly demonstrated from the pandemic but serves as one of the many ways systematic racism is heavily embedded within the field of science. This cross-case study was composed of 34 teacher candidates from two science methods classes. Interested participants provided consent to participate in this research project which allowed researchers to analyze their *anti-racist and justice-oriented science teaching checklists and designed curriculum.

Using a cross-case study approach, I explored teacher candidates' conceptualizations of what and how anti-racist science teaching is and looks like. Analyses revealed differences in the class's content and overall ability to explicitly name anti-racist science teaching strategies. Additionally, teacher candidates provided multiple means of representation and expression for anti-racist science teaching strategies. For example, one candidate conceptualized identifying one's racial biases as acknowledging that everyone, including themselves, has biases. However, another candidate conceptualized identifying one's racial biases as emphasizing the need for individual reflection to understand personal biases. The findings highlight the importance of anti-racist explicitness and acknowledging others' varying conceptualization of anti-racist concepts.

This study matters because in aspiring to remediate and reinvent our educational systems to benefit all students, science teacher educators will require additional support and resources to be successful. Furthermore, it is necessary for science teacher educators to construct roles as racially-just educators that understand how to conceptualize and enact anti-racist and justice-oriented science teaching strategies.

Session D-7

Oral Health Nutrition and Clinical Sciences 2

Friday, March 4, 2022, 3:00 pm

Location: Templo Mayor

256 3:05 pm

Sensitive Analysis of Cancer Biomarkers Using Laser Wave-Mixing Detector Interfaced to Microfluidics

Jie Liang, Chemistry (D)

Novel nonlinear multi-photon laser wave-mixing detector interfaced to microfluidics is presented as a sensitive detector for biomarkers with different charges and sizes for the early detection and diagnosis of cancers. The wave-mixing probe volume is small (picoliter), and hence, it offers high spatial resolution and it is inherently suitable for interfacing to microfluidics, microarrays and capillary-based separation systems. The wave mixing signal has a quadratic dependence on analyte concentration, and hence, it yields big changes in signal for small changes in analyte concentration (an ideal sensor). The wave-mixing signal is coherent and it can be collected with virtually 100% collection efficiency and high signal-to-noise ratios. Our zeptomole-level wave-mixing detection sensitivity is comparable or better than those of current detection methods for biomarkers including enzyme-linked immunosorbent assay (ELISA) and wave mixing is much faster and more cost effective. Laser wave mixing is an optical absorption-based method, and hence, it can detect both fluorescing and non-fluorescing analytes. Once can use a visible laser to detect analytes using labels or use a UV laser to detect label-free native analytes. Unlike conventional absorption methods, wave mixing can detect micrometer-thin samples. Chip-based electrophoresis allows both high chemical selectivity and sensitivity levels. Microarray-based wave-mixing detection systems allow convenient and high throughput analyses. Using compact solid-state lasers, one can design wave-mixing – microchip detectors for field use.

257 3:20 pm

Modeling Non-Alcoholic Fatty Liver Disease in hIPSC Derived Hepatocytes

Karina Pastrana, Biology (U)

Non-alcoholic fatty liver disease (NAFLD) is the leading cause of chronic liver disease in adults and children worldwide. Despite intensive research, treatment options for NAFLD are limited, and the disease generates significant financial and public health burdens. Genome-wide association studies discovered a polymorphism in the PNPLA3 gene that confers a higher risk of developing inflammation as a result of NAFLD, and of progressing to liver fibrosis. The mechanism by which the variant affects NAFLD progression is not understood. Hepatic stellate cells (HSCs) are resident fibroblasts in the liver that are important for healing liver toxicity, but they can also contribute to fibrosis as a result of chronic injury. Induced pluripotent stem cells (iPSCs) are used as a reliable source of liver cells due to their unlimited expansion and differentiation potential. Our previous studies have shown that iPSC-derived hepatocytes with the PNPLA3 risk variant accumulate more lipid droplets and have increased activation of genes involved in lipid processing and inflammation. However, understanding the role of the PNPLA3 risk variant in hepatic stellate cells has a greater potential of preventing liver fibrosis, the most debilitating outcome in NAFLD. We propose to use iPSCs to answer two related questions; 1) does the PNPLA3 risk variant enhance the activation state of HSCs, and 2) how does fat accumulation in PNPLA3 variant hepatocytes lead to HSC activation. For this purpose, we are generating HSCs from iPSC with the wild-type and PNPLA3 risk variants. We will confirm successful differentiation by the expression of hepatic stellate cell lineage-specific markers. We will also treat iPSC-HSC with environmental mediators known to induce injury in NAFLD, such as palmitic acid, to mimic liver toxicity. Then, we will measure

HSC activation in both wild-type and variant genotypes. We aim to provide a better understanding of the progression of liver fibrosis in NAFLD with the PNPLA3 risk variant genotype in efforts to identify new therapeutic targets for this devastating disease.

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258 3:35 pm

Asian Glow: Aldehyde Dehydrogenase-2 Enzyme Polymorphism in the Asian Population and Its Link to Hepatocellular Carcinoma

Jenna Balingit, Cellular and Molecular Biology (U)

Overall, the Asian population in the US has a lower risk of cancer, but higher rates of specific cancers, such as liver cancer. About 30-50% of the Asian population carry a genetic mutation where the body has a hard time properly breaking down alcohol when ingested. This genetic mutation results in decreased production of the Aldehyde Dehydrogenase-2 (ALDH2) enzyme for its role in breaking down alcohol in the liver. ALDH2 is an essential enzyme to break down ethanol when alcohol is consumed since alcohol is considered carcinogenic to the human body. Many sociological and physiological factors have been identified on why liver cancer is prevalent in the Asian community, but the role of ALDH2 is unclear. This narrative literature review identified articles on ALDH2 using PubMed, PsycINFO, cBioPortal, and Protein Data Bank using keywords Asian, ALDH2, enzyme, liver cancer, hepatocellular carcinoma, alcohol metabolism, mortality, screening, alcohol. Reference lists of key articles were reviewed. This presentation will summarize the findings from this literature review and highlight implications. Recommendations for future research will be provided.

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259 3:50 pm

Coordination of body state and foot placement related muscle activation for frontal plane walking balance

Remy Sprague, Kinesiology (U)

Foot placement is a dominant strategy for maintaining frontal plane walking balance. The purpose of this study was to establish when foot placement related muscle activation is most related to body state and define a general muscle coordination pattern for controlling foot placement based on body state. We hypothesized that hip muscle activity is significantly related to the center-of-mass (COM) and swing foot states prior to the onset of muscle activation in a direction and amplitude dependent manner. To test this, twelve healthy subjects walked on a treadmill while wearing a virtual reality headset and were exposed to continuous, pseudorandom, frontal plane visual perturbations to induce increased balance responses. Body state kinematics (position and velocity of the COM and swing foot) and muscle activity (EMG) of the Gluteus Medius, Tensor Fasciae Latae, Gracilis, and Adductor Longus were recorded for at least 200 strides per trial. Foot placement control timing was assessed by first segmenting and averaging the body states and EMG signals within each 2% increment of the gait cycle and then using multiple linear regression analysis to identify body state-EMG time window combinations where body state best predicted individual muscle EMG. Further multiple regressions were performed near the peak correlation times to analyze body state regression coefficients. We found that hip abductor muscle activation is best correlated to body state in early swing (69.6-71.4% of the gait cycle). For the adductors, three peak correlation times were identified at pre, early, and mid-swing (60.4-60.8%, 71.6-73.4%, and 82.8% of the gait cycle, respectively). One-way repeated measures ANOVAs examining the effect of muscle type on individual regression coefficients revealed significant differences for all body states ($p<0.001$). Each body state had a significant effect on muscle activity depending on the time range used. Early and mid-swing activations for both abductors and adductors revealed coefficients for position and velocity of the COM that were significantly different from zero in a direction dependent manner. More medial/lateral COM states during single support require more medial/lateral corrective foot placement through decreased/increased hip abductor activity and increased/decreased hip adductor activity during early and mid-swing phase.

SRS

Abstracts of Presentations

Session E

San Diego State University

Session E-1

Oral Behavioral and Social Sciences 10

Saturday, March 5, 2022, 10:00 am

Location: Visionary Suite

260 10:05 am

A Mixed-Methods Examination of Colorism in the Context of Indian Children

Karanjot Kaur, Child Development (M)

Colorism, defined as discrimination based on skin color, has been explored by western scholars in the context of race, racism, and the black experience. However, this issue is a global one, and there is scant literature in Asian countries on examining children's concept of colorism. For example, the literature about colorism in India focuses on skin-lightening products, media, and marriage. To bridge this gap, this study aims to explore colorism in children. Specifically, we will explore (1) how young children and older children differ in attitudes about skin color based on children's gender and location (North India vs South India), (2) whether colorism has an impact on children's perception of their own skin color, and (3) does colorism have an effect on fairness in children. In order to answer these questions, this mixed-methods study was conducted with 95 participants (ages 4-9) in two Indian states of Punjab and Kerala. Participants were recruited through schools in both rural and urban areas using snowball sampling. In these experiments, conducted over zoom, participants were asked to distribute tokens to 6 characters with 3 different skin tones (Light, Medium, Dark) for doing 3 tasks around the house such as watering the plants, cooking food, and fixing the house. The participants then self-reported on various questions related to skin tone using the help of a color wheel. Preliminary analysis shows that children show a preference for lighter skin tones, self-reporting themselves as lighter skin tones in both Kerala and Punjab. This preference seems to remain steady across different age groups and different genders. Further data analysis will be conducted to examine nuanced differences. The issue of colorism is a problem in India that often goes unacknowledged due to the lack of discourse on it. The results of this study will add to the limited evidence of colorism and children in India which can hopefully bring awareness to teachers, parents, and policy-makers.

261 10:20 am

Mental health service availability in Oaxaca and Michoacán, México

Stephanie Vera, Public Health and Latin American Studies (M)

Purpose and Goals: The purpose of this research project was to identify mental health services that offered specific services and resources to migrants returning from the US, specifically in the states of Oaxaca and Michoacan, Mexico. The primary goals consisted of identifying mental health services and gathering information on the organizations that offered mental health services to the migrant population in each state. The hypothesis was that Oaxaca City, Oaxaca would have more mental health services compared to the rural area of La Piedad Michoacán, Mexico.

Methods: The data for this project was collected through qualitative observation and interviews with each organization. Data was collected by walking around each city taking notes of the mental health organization that I could identify. Public and private entities that offered either social-emotional services or migrant support were included in the study. Ten organizations were identified, but only three participated in the study. Seven of the organizations were closed due to the COVID pandemic or required an advance appointment.

Findings: All three entities were government-based services. Two were located in Oaxaca City, including the Instituto Oaxaqueño de Atención al Migrante (IOAM) and Centro de Orientación al Migrante de Oaxaca (COMI). These two federal programs serve Central American migrants coming to Mexico focusing on refugee and employment support. In La Piedad, Michoacan, I interviewed a therapist at Desarrollo Integral Familiar (DIF), a public service offered to the community in the city. I discovered that this DIF has an additional building specifically for all types of rehabilitation and was called Centro Integral de Rehabilitacion,"which had high utilization and a waiting list. The common differences that were observed in both of these states was the inaccessibility of resources, lack of mental health organization and vague description of the audience the organization is targeting. For future research it would be to get an organizational insight from local mental health services (public or private) and focus on partnership in communication in local communities.

262 10:35 am

Female Genital Mutilation in Kenya in comparison to Somalia

Denisse Vera, Political Science and International Security and Conflict Resolution (U)

As an undergrad majoring in International Security and Conflict Resolution, my thesis consisted of understanding the importance of women's rights in order to promote peace and conflict resolutions. This presentation aims to examine the human rights violation of female genital mutilation (FGM) in Kenya compared to Somalia. I have researched each country's substantial repercussions and legislation against the violent practice. Although I thoroughly examine FGM in Somalia, I will emphasize legislation in Kenya because of Kenya's progress in policy change. In particular, I study Kenya's 2011 law that prohibits FGM and the specific challenges that still hinder women's liberation within the country. It's also necessary to recognize the fundamental differences between the two countries; this includes the countries' overall economic levels, education levels, and levels of democratic prosperity on both the subnational and national levels. Finally, the presentation will highlight the differences and similarities between the effects and consequences of FGM in Kenya and Somalia.

263 10:50 am

Demographics and Vulnerability Factors of Victims of Sexual Exploitation in Metro Manila, Philippines: A Secondary Data Analysis at San Diego State University

Bridget Stephenson, Social Work (M)

Human trafficking, also known as modern-day slavery or trafficking in persons, is a global epidemic. Global research indicates vulnerability factors of victims include being a minor involved in sex trafficking victimization, lacking social support, disruption to education, having one or more dependent children, being diagnosed with a mental health disorder, housing instability, previous abuse, and financial instability. In the Philippines, a number of those working within the sex industry, both men and women, do so by voluntary means, but others identify the means of force, fraud, or coercion in their experiences. Many of these individuals encounter forms of oppression and intersectional marginalization including abuse; economic disparity; disruption in educational experiences; mental health concerns; and substance use issues. Literature indicates there is more research dedicated to increasing the knowledge regarding risk factors for sex trafficking of minors. While the many individuals trafficked as children risk being exploited as adults, knowledge is needed to understand the risk factors facing victims, both males and females, of exploitation in their adult years. This study answers explores the demographics and vulnerability factors of adults experiencing sexual exploitation in Metro Manila, Philippines. This secondary data analysis is conducted on research data provided by “A human rights-focused HIV intervention for sex workers in Metro Manila, Philippines: evaluation of effects in a quantitative pilot study” by Dr. Lianne Urada. The variables utilized include the following: gender identification, age, years of education, married or living with a partner, children (0, 1, 2+), income, drug use in the past 3 months, violence or abuse experienced as an entertainer or street sex worker (physical and/or sexual abuse), and ever trafficked. The outcome variable of “ever trafficked” and was run through a logistic regression with the other identified input variables to see which demographics and previous experiences are significantly associated with being trafficked for commercial sex. Findings suggest those with a higher number of dependents, lower education, females, those using substances, and those with lower income levels are more likely to experience trafficking. This data is significant because it informs the risk factors of sex trafficking in the Metro Manila population.

264 11:05 am

Potential Neuroscientific Effects of (Buddhist) Ethical Discipline on a Meditative Practice

Bradley Pierce, Philosophy (U)

This research centers on the lack of research done on ethical discipline within the bounds of neuroscience. There are neuroscientific studies that center on studying the neural effects of compassion, empathy, and sympathy; but there is a lack of study done on individuals that have a developed ethical regiment that they abide by. Individuals that have developed high levels of ethical discipline not only express morality such as compassion towards their fellow human beings, they also practice higher levels of renunication that have yet to be studied in a neuroscientific context. These higher levels of renunciation go to benefit not only one's self, but also others. Specifically, this can be seen in Buddhist morality within its precepts. The Buddha encouraged that lay followers abide by the eight precepts of abstaining from killing, stealing, the use of harsh speech, sexual misconduct, the use of intoxicants, eating after noon, entertainment and beautification, and the use of luxurious beds. In Buddhism, lay followers are encouraged to follow these eight precepts when undergoing special observance days, or when one can in order to heighten the development of of one's ethical disicipline. Renunciation, a major aspect of Buddhist morality, is absent from neuroscientific literature but clearly has some sort of effect on the brain. This effect not only benefits one's meditative practice, but also carries benefits such as better wellbeing and focus levels outside of a meditative practice. Ethical discipline does not merely come down to striving to cultivate a compassionate attitude. Rather, ethical discipline involves a certain amount of renunciation that makes the cultivation of this compassionate attitude much easier. The evidence for how beneficial renunciation is, is prevalent within Buddhist literature, and needs to be made more prevalent within neuroscience.

265 11:20 am

Food insecurity and access to primary healthcare among sex workers during the COVID-19 pandemic: Findings from a community-based cohort in Vancouver, Canada

Elizabeth Frost, Public Health (D)

Background: Sex workers have a greater burden of HIV/STI and addressing structural determinants related to food and other basic needs may be important for facilitating access to needed health services. The COVID-19 pandemic created challenges in access to care and economic vulnerabilities for many marginalized women including sex workers. The objective of this study was to investigate the association between food insecurity as a measure of economic vulnerability and access to healthcare during the COVID-19 pandemic among sex workers in Vancouver, Canada.

Methods: This study used data from a community-based, prospective open cohort of women sex workers in Vancouver, Canada (An Evaluation of Sex Workers’ Health Access, AESHA; 2010-present). Community-based and experiential staff administered semi-annual and COVID-19 questionnaires from October 2020–August 2021. We used multivariable logistic regression confounder model using generalized estimating equations (GEE) for repeated measures to identify the association between negative changes to food security and difficulty accessing primary healthcare (i.e., family doctor or nurse) during the COVID-19 pandemic.

Results: Of 172 participants, 41% (n=71) experienced negative changes to food security and 26% (n=45) reported challenges accessing primary healthcare in the last 6 months at their baseline COVID-19 interview. The median age was 45 (IQR:37-53), 54% were of Indigenous ancestry, 47% identified as a sexual minority, and 35% were recently cohabitating with other people. Prevalence of violence was high; 81% experienced intimate partner violence (IPV) during their lifetime, 48% sex work specific community level violence, and 91% any physical/sexual violence. After controlling for key confounders, negative changes to food security were associated with increased odds of difficulty accessing primary healthcare during the COVID-19 pandemic (AOR 1.91, 95% CI 0.95-3.82).

Conclusion: Our study highlights the links between structural determinants of health such as food insecurity and access to healthcare for sex workers, and provides unique findings on the ways in which these concerns may be exacerbated during the pandemic. Findings indicate a need for social policy changes that remove structural barriers in accessing food and social services that provide assistance with food security for marginalized women.

Session E-2

Oral Behavioral and Social Sciences 11

Saturday, March 5, 2022, 10:00 am

Location: Legacy Suite

266 10:05 am

Haitian Diaspora in Tijuana: A restaurant as a Migrant Community Resource

Anabel Gutierrez, Latin American Studies (M)

Culturally appropriate food is important to creating a sense of home for migrants. This research sought to verify this notion among Haitian migrants in Tijuana. However, in a state of constant transit, Haitian migrants have traveled through as many as eight countries prior to arriving in Tijuana to try their luck at asylum in the United States. Through this perilous journey, food was noted by participants as simply nourishment and the mode of preparation or ingredients were insignificant. As participants revealed, the importance of Haitian food lies in food spaces as access to Haitian migrant community networks. Haitian restaurants in temporary host countries like Mexico provide community resources for Haitian migrants. This research study utilizes qualitative mixed methods consisting of a survey and an oral open-ended interview with participants that were 18+ and identified as Haitian migrants living in Tijuana (n=25). Research findings are divided into two broad categories: factors impacting the decision to migrate and objectives at destination. Major themes identified under factors impacting migration include: instability and insecurity, lack of opportunities, and displacement. Major themes identified under objectives at destination are stability, opportunities, and legal pathways to remain in Mexico or seek asylum elsewhere. Data was collected at Cuisine Creole, a Haitian restaurant in Tijuana, over a 14-day non-consecutive period from October 2021 to January 2022. This study seeks to portray Haitian migration through a testimonial ethnography centering Haitian voices, their migrant experiences, and the importance of Haitian migrant community networks.

267 10:20 am

Generation Z: Will The Birth Rate Remain The Same?

Kamia Way, Economics (U)

This report served the purpose of investigating whether Generation Z would continue the downward trend of the birth rate. The birth rate has dropped significantly over the years and recently dropped by four percent in 2020. This decrease can lead to negative societal and economic impacts which encouraged our team to choose this topic for our research. To conduct this research, we targeted a sample of over 50 students at San Diego State University between the ages of 18-24 years old. We had at least one representative from all undergraduate colleges and the graduate studies provided at SDSU.

Before distributing the survey, we conducted extensive secondary research that focused on areas such as the population trend, government participation, birth rates in developed countries along with many others. Our survey consisted of 16 questions that were designed to help us investigate our overarching research objective and the factors that may or may not have influenced their decision to have children. After distributing our survey, we conducted multiple tests through SPSS to help us analyze and evaluate our data.

The test results concluded that our sample of Generation Z is at approximately the same replacement rate as well as surpassing the average birth rate over the past 40 years. CrossTabs analysis tests brought to our attention that gender, type of college, and religion had no affect or significance on our participant's ideal number of children. However, we did find out that most participants see themselves having children 2-3 between the ages of 26-30. Unfortunately, we were unable to adequately answer some research questions and would recommend that this research be conducted again and on a larger scale.

268 10:35 am

Underappreciated Labor: College Students and the Job Search

Anna Kelley, Sociology (U)

It is well known that the transition from college to the workforce is an emotional time for students. These feelings span the emotional range as students anticipate graduating college, starting jobs, and officially entering adulthood. By utilizing the lenses of emotional, relational, and venture labor, I frame the job search and the related labor as a distinct but connected step between college and the workforce. Using survey and interview data, this study sought to further understand the emotions that shape this time as well as their root causes. Our data found that students' emotions are predominantly negative throughout this period, with four of the top five most commonly used emotion words being negative. Through this, we establish that the emotions students feel are both a response to approaching life changes, as well as a way to prepare them for their desired careers.

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269 10:50 am

Designing a Motivational Interviewing intervention for oral health: Literature Review and Formative Interviews

Sabrina Cesare, Interdisciplinary Studies in Three Departments - biology, psychology, business (U)

Purpose: Explore existing literature regarding motivational interviewing (MI) and adolescents' oral health (OH) status and behavior, and use this information to inform a new MI intervention.

Methods: A literature search was executed through PubMed using these search terms: ("oral health" OR "dental" OR "cavities" OR "caries" OR "dental caries") AND ("motivational interviewing"), and Reference Review.

Two primary areas of interest were adolescents' OH status and MI. Initially, 177 articles were identified, 21 remained after title/abstract review, and 17 full papers were read. Of the 17 papers, 8 discussed MI with children and were included in the final review (2014-2020).

The review was used to inform the design of a MI intervention for Mexican-origin adolescents ages 14-19. Five 1-hr online formative interviews were conducted with adolescents from Vista Community Clinic to pre-test intervention materials during summer 2021 for a $15 gift card. Interview feedback was used to finalize the MI intervention.

Results: Of the 8 papers that discussed MI to improve OH in children, only 1 specifically pertained to adolescents. MI interventions with children focused on motivating parents of younger children, not directly on older children/adolescents. MI proved to be effective in increasing the knowledge of the study population. Whether MI actually improved OH or not varied throughout the studies.

Interview participants described their current hygiene behaviors, set goals, and what they liked about the MI intervention materials. MI was most effective when presented in a conversational manner, interactive activities were included, and that goal-setting was not overused.

Conclusion: The eight studies reviewed generally support the use of MI in improving OH knowledge in children, but not necessarily behavior. There is a lack of research regarding MI with adolescents, specifically those from low-income families. We drew on current information available regarding OH for adolescents, and shifted our MI intervention delivery online during a global pandemic. The online format was found to be feasible and acceptable to participants. This literature review and formative interviews guided the creation and final design of our online MI intervention.

270 11:05 am

Do Parenting Behaviors Mediate the Relationship Between Parental Mental Health and Child Weight Status?

Angel Chukwu, Public Health- Health Promotion and Behavioral Sciences (M)

Introduction: Childhood obesity remains a pressing public health issue, with a U.S. obesity prevalence of 19.3% and about 14.4 million children considered obese. Childhood obesity is associated with many poor health outcomes, such as hypertension and diabetes. While childhood obesity is a nationwide health issue, its prevalence is unquestionably greater among racial and ethnic minority children, which is why it is vital to determine factors that influence childhood obesity and lead to these disparities. Multiple factors can cause childhood obesity; among children, parental influence and psychological health are crucial factors that influence overweight/obesity status. Literature also shows that parents experiencing a psychological issue may lead to negative parenting behaviors. However, there has yet to be any literature that examines the intersection between parenting strategies, parent mental health, and its influence on child obesity in Latinos. The objective of this study is to determine if parenting strategies related to a child's eating and activity mediate the relationship between parent mental health and child body mass index (BMI). This study addresses gaps in the literature by evaluating this relationship in Latino/Hispanic individuals residing in predominantly Mexican-origin communities in Southern California. Methods: We analyzed survey data from a subset of parents (N=128) who enrolled in the California, Childhood Obesity Research Demonstration Study (CA-CORD), which was conducted in Imperial County, California between 2012-2016. Parents reported the following: demographic characteristics and socioeconomic indicators, symptoms of depression, parenting strategies related to their child's health and weight (i.e., Parenting Strategies for Eating and Activity Scale (PEAS) scale). Child BMI was also assessed. We will conduct mediation analyses to find the relationship between parent mental health and child BMI z-score and identify potential mediators. Results: While we have yet to procure our findings, we hypothesize that we will find parental mental health linked to higher BMI z-scores through the mediating role of parenting strategies. Discussion: The results of this study can add to the literature about the effects of parental mental health on child BMI z-scores seeking to create interventions to reduce childhood obesity rates.

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271 11:20 am

Application of RE-AIM Framework on Conmigo, A Physical Activity Program for Latina Mother Daughter Pairs

Michelle West, Public Health - Health Promotion & Behavioral Science (M)

Latina girls are disproportionately affected by the issue of childhood obesity. Latina girls have higher rates of obesity (25.6%) when compared to White girls of the same age (16.1%) (CDC, 2021). Low physical activity rates among Latina youth may be a strong contributing factor to the high prevalence of obesity among this population (CDC, 2021). Conmigo is a physical activity program for Latina mother and daughter pairs living in San Diego, California (Arredondo, n.d.). To ensure the implementation of evidence-based programs into a community setting it is suggested that sound evaluation be conducted (Estabrooks et al., 2018). RE-AIM is an evaluative framework originally developed to facilitate dissemination and implementation of evidence-based programs into community settings. Current research suggests that iterative use of the framework is needed prior to and during the implementation process (Glasgow et al., 2019). The RE-AIM framework consists of the five constructs of reach (R), effectiveness (E), adoption (A), implementation (I), and maintenance (M) (Glasgow et al., 2019). For the purpose of this application, reach, implementation, and adoption were defined according to the context of Conmigo and measured quantitatively. Descriptive statistics were used to measure reach as the number of participants from the target population who were able to be helped by Conmigo. Implementation at the individual level considers the fidelity of physical activity and didactic instructor using a modified version of the Breitenstein Adherence Checklist (Breitenstein et al., 2019). Physical activity was also rated using a Sofit-X survey (Duesterhaus, 2011). Both of these were given quantitative fidelity scores. Adoption was measured in settings where recruitment took place at pre-implementation. This is measured as a proportion of settings that agreed to recruit program participants compared to the number of settings that were approached and didn't assist with recruitment. An evaluation of such programs as Conmigo, using RE-AIM, is necessary to guide adaptations and ensure the successful implementation of the program into community settings. This data will help bring evidence based programming to communities that are most in need of them.

Session E-3

Oral Biological and Agricultural Sciences 5

Saturday, March 5, 2022, 10:00 am

Location: Pride Suite

272 10:05 am

Researching the Binational Distribution of the Desert Mountain Sage and the Genetics of its Subspecies

Eduardo Charvel, Evolutionary Biology (U)

Salvia pachyphylla, also known as the Desert Mountain Sage, is a high elevation plant found near the west coast of the United States and along the sierras of Baja California, Mexico. This species occurs only at high altitudes, consequently, some of its populations have become isolated at the peaks of mountain ranges. Three subspecies are currently recognized based on morphometric analysis of leaves and flowers: pachyphylla, eremopictus, and meridionalis. Subspecies pachyphylla occurs in California and Nevada, subspecies eremopictus occurs in Arizona, and subspecies meridionalis occurs in Baja California. However, phylogenetic analyses using the Internal Transcribed Spacer (ITS) region have not shown clear genetic separation among the taxa. Therefore, ITS alone may not be an optimal choice for attempting to elucidate the relationship among these three subspecies. In this study, our goal is to revisit this taxonomic group using a variety of nuclear and chloroplast markers to determine the validity of these subspecies. We have collected material from different populations representing the three subspecies and have supplemented it with herbarium specimens. We are performing PCR and sequencing the amplified products in order to find markers that may better inform a phylogeny of the different subspecies.

273 10:20 am

Population dynamics of Agave shawii in Cabrillo National Monument

Paulina Arellano, Biology (U)

Agave shawii subsp. shawii (Shaw's agave) is a critically endangered plant, with a binational distribution, endemic to the coastal sage scrub habitats in Southern California, USA and Baja California, Mexico. The primary threat to Shaw's agave is human interference, which includes habitat loss, habitat disturbance, and land development. During Summer 2021, I had the opportunity to participate in the Binational Studies Program at San Diego State University. During this program, I was able to petition to add Shaw's agave to the Mexican Endangered Species list (NOM 059) using the Método de Evaluación del Riesgo de Extinción de Plantas de México (MER) which determines the threats and the need for protection. Historically, and to this day, the Kumeyaay people have harvested Shaw's agave for its nectar, flowers, and rosettes. In addition, the Kumeyaay would roast and eat the agave, as well as using the agave fibers to make tools such as fishnets, carrying nets/baskets, and clothing/shoes.

This presentation focuses on understanding the importance of conserving plants with binational distributions while specifically studying Shaw's agave and its existing populations at Cabrillo National Monument (CNM) which are not forming viable seeds. We hypothesize that the individuals at CNM are cloning and are experiencing high levels of inbreeding. Thus, we aim at determining whether the individuals at CNM are genetically identical using genetic approaches. Methods of research began with taking samples from multiple plants growing at CNM to investigate whether they were originally planted from the same genetic stock. Research efforts focused on understanding how the rosette occurrences in Cabrillo (CNM) differ from one another. Further research included performing DNA extractions, DNA purifications and running gel electrophoresis for various populations of A. shawii. Chloroplast markers have been successfully amplified from the DNA samples and will be sequenced to assess clonality.

Future research efforts should focus on conducting genetic analysis of individual rosettes at Cabrillo National Monument to determine genetic diversity. Other future research efforts include studying why populations in Southern California and Baja California reproduce asexually instead of sexually, which can be done by documenting pollination biology, thus aiding conservation efforts.

274 10:35 am

Taxonomy and Population Genetics of a Barrel Cactus in the Gulf of California

Yazmin Lommel, Biology (M)

Ferocactus gatesii (synonym Ferocactus gracilis ssp. gatesii) is an endemic barrel cactus that is native to the small islands of Bahía de los Ángeles (BLA) located in the Gulf of California, Baja California, Mexico. This species resides on only 7 of the 16 small islands in the Biosphere Reserve of the same name. Because of F. gatesii' limited presence and distribution, we predict that there is minimal genetic diversity within the species. Currently, scientists hold two main taxonomic hypotheses of F. gatesii: 1.) it is its own distinct species; or 2.) It is a subspecies of F. gracilis (the current taxonomic status). Past studies have concluded that Baja California is likely a result of the separation of the Baja California peninsula from mainland Mexico, creating islands within the Gulf where F. gatesii is present. I hypothesize that this vicariant event allowed F. gatesii to have significant differences between its close relatives on the nearby peninsula and the mainland which can be detected at the genetic level. We predict that: 1.) there are minimal genetic differences of F. gatesii between the individual islands, and 2.) all populations of F. gatesii are different from related species. We aim to: 1.) analyze the Single Nucleotide Polymorphisms (SNPs) of F. gatesii in relation to its close relatives and 2.) analyze the SNPs of F. gatesii across the different islands. Regarding goal 1, live samples and herbarium specimens were collected to produce SNPs via DaRTSeq. A phylogeny will be constructed from the SNPs using the statistical program Beast2 to evaluate F. gatesii' relationship to its close relatives. In order to answer question 2 whether there are genetic differences in F. gatesii throughout the islands, F. gatesii samples were collected in the summer of 2019 for genetic analysis via SNPs generated from DaRTSeq. From the SNP data gathered, we will perform population genomic analysis through k-means clustering and Haplotype Network in R-Studio. Our findings can then be used by land managers and scientists to conserve F. gatesii from threats such as genetic inbreeding, climate change, poaching, and habitat degradation.

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275 10:50 am

Resilient restoration of Coast Live Oak in southern California

Vincent Trang, Biology, Cellular and Molecular (U)

Quercus agrifolia, or the Coast Live Oak, is a species of oak native to California, which as the name suggests, is predominantly found in coastal regions from west of the Sierra Nevadas down into Baja California. The species has two identified varieties— Quercus agrifolia var. agrifolia and Quercus agrifolia var. oxyadenia— These varieties differ in the amount of trichomes on their leaves, with the var. oxyadenia having more trichomes and a lighter color as a result, both of which may confer some resistance to extreme temperatures and aridity. The presence of trichomes could increase water retention and be an adaptation to drought conditions. Interestingly, this variety is distributed more inland and has a restricted distribution in the south of California and northern Baja California. Aside from its keystone ecological significance as a species native to the region, Q. agrifolia has historically been culturally significant to many tribes indigenous to the area and we are working closely with them. In this study we hypothesize that the var. oxyadenia exhibits higher drought tolerance in relation to the var. agrifolia. We are performing genomic analysis to identify populations with high genetic diversity and conducting a greenhouse experiment to test whether individuals of var. oxyadenia perform better when subjected to drought conditions. We have partnered with Tribal groups and have collected seeds from Tribal lands and other areas where these two varieties are distributed. We have planted the seeds and have measured their performance (e.g. germination success, height, mortality, photosynthesis). Currently there are over 1500 trees that are being subjected to an irrigation experiment that seeks to mimic stressful conditions brought on by the changing climate. We have found that the germination success for southern populations is 84%, however, we have identified some populations that are struggling to produce viable seeds as they are being infected. The results from this experiment will provide great insight on the stress response of these trees, and ultimately allow us to aid indigenous tribes with oak conservation and restoration projects.

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276 11:05 am

Spiny and Struggling : Reproductive Ecology of a Rare Native Cactus

Niveditha Ramadoss, Evolutionary biology (D)

Cylindropuntia wolfii is a rare and endemic cactus of the Sonoran Desert at the border of California and Baja California. However, it is predominant in the Mountain Springs area (Imperial County, CA), offering protection to wild animals and birds, a microhabitat for insects, and a food reserve for bees. Previously, our lab characterized the sexual system of C. wolfii as functionally dioecious (female and male sex are found in separate individuals). Although C. wolfii produces a massive quantity of flowers, it rarely produces fruits with mature seeds. As seeds are the product of sexual reproduction, it is important to determine what influences its production to successfully conserve this species. Our goal is to identify factors influencing reduced seed production in this species. Multiple a) extrinsic and b) intrinsic factors affect seed production. Extrinsic factors such as lack of pollinators can result in unfertilized ovules and lack of mature seeds. On the other hand, intrinsic factors can be developmental (pollen viability and stigma receptivity) or genetic (deleterious mutations accumulated due to inbreeding). In order to evaluate whether extrinsic factors influenced the seed production we conducted a field survey for visitors and measured the pollinator visitation rate between male and female plants. Our results showed that males attracted more pollinators than females. This biased visitation could affect the seed production especially when the pollinator density is low, as the females would be rarely visited. In order to evaluate whether intrinsic developmental factors affected seed production we used an in-vivo pollen germination test. Our results showed that the pollen from male flowers (since females do not produce pollen) were viable and the pollen tube germination was observed in both male and female stigma and style. This suggests that pollen viability and stigma receptivity are not related to the reduced seed production in C. wolfii. Experiments are underway to test the effect of genetic factors on the reduced seed set. This research will enhance our understanding of the limited knowledge of cactus reproductive biology, especially in the genus Cylindropuntia, which forms an important part of desert ecosystems in the United States.

Session E-4

Oral Biological and Agricultural Sciences 6
Saturday, March 5, 2022, 10:00 am
Location: Park Boulevard

278 10:05 am

Spore-forming Paraclostridum benzoelyticum from human IBD fecal samples produces a potential toxin specific to Bifidobacterium

Nicole Jacobson, Cellular and Molecular Biology (D)

The human gut microbiome is a very dynamic and complex system in which bacteria are vying for survival. Bacteria have evolved a wide range of mechanisms in order to outcompete other species to establish growth in available ecological niches and/or gaining and maintaining pathogenicity. In the case of the human gut, a handful of common players that can be both commensal and opportunistic pathogens. These common genuses include Bacteroides, Clostridium, Faecalibacterium, Eubacterium, Ruminococcus, Peptococcus, Peptostreptococcus, and Bifidobacterium among others. It is thought that dysbiosis of the gut microbiome can lead to diseases such as Crohn's disease and ulcerative colitis. We will focus on a specific gut microbe, Paraclostridum benzeolyticum, a gram negative, spore forming, obligate anaerobe with potential to be pathogenic (Rai et al., 2020). The strain that will be discussed was isolated from a fecal sample of a healthy individual living with an ulcerative colitis patient. While isolating phages from fecal samples, we found that this P. benzoelyticum lysed all previously isolated Bifidobacterium strains. This led to further characterization of the source of lysis. We found that a P. benzoelyticum culture passed through a 0.45 micron filter which survived 95°C treatment for 10 minutes could still lyse the Bifidobacterium strains. When the same culture was passed through a 0.22 micron filter, lysis was no longer observed. We hypothesize that the P. benzoelyticum strain we isolated produces a toxic protein, likely an amylase, that is specific to Bifidobacterium species. We will investigate whether Paraclostridium-produced amylase is indeed responsible for lysis, and whether the amylase is a virulence factor in IBD patients.

279 10:20 am

Phage therapy to combat multi-drug resistant persistent infections in cystic fibrosis patients

Hamza Hajama, Cellular and Molecular Biology (M)

Microbial resistance to antibiotics is rising across the globe, especially in individuals with chronic illnesses. Specifically, patients suffering from cystic fibrosis (CF) face chronic antibiotic-resistant bacterial infections in their airways, lungs, and in some cases bloodstream. Over the lifetime of the patient, these infections become progressively more resistant to antibiotics and eventually become pan-resistant and impossible to treat using traditional methods. Many alternatives to the traditional antibiotics route have been proposed, such as probiotics, immune stimulation, and antimicrobial peptides. Moreover, therapeutic use of bacteriophages in treatment of CF lung bacterial infections has become a viable treatment option. Of specific interest is the treatment of Achromobacter xylosoxidans infections in CF patients. Achromobacter is a gram negative opportunistic pathogen found ubiquitously in the environment, which often colonizes immunocompromised individuals. Bacteriophage therapy is a relatively new and very promising experimental treatment option that is also a highly personalized form of care. Several challenges face the more routine use of phage therapy, including the poor understanding of some of the pathogens, for example Achromobacter itself and the evolution of phage resistant strains over the course of the infection .

While following Achromobacter strains isolated over a time course of months or years, we have found that these strains change their sensitivity to different phages. This requires us to continuously isolate phages that may be used for therapy. Our goal is to understand the mechanisms used by these bacterial strains to become resistant to various phages. One mechanism is apparently related to prophages present in the genomes of the lysogens. We are mapping the relationship between specific prophages and distinct lytic phage candidates for therapy. Once we understand these relationships, picking the correct complement of lytic phages for patient strains should become more predictable. We will also follow to what extent these prophages are being exchanged between different bacterial strains within each patient's microbiome.

280 10:35 am

Identifying the receptors and other factors required by phages that infect Achromobacter species (Achromophages)

Ryan Rowe, Microbiology (M)

Cystic fibrosis is a human chronic genetic disease that affects the lungs and other organ systems. Cystic fibrosis patients develop chronic bacterial infections that become increasingly recalcitrant to antibiotic treatment, often leaving doctors without treatment options and leading to death. Bacteriophage therapy is an experimental treatment being used to control these infections. For optimal treatment options, a deep understanding of the therapeutic phages is required. However, both the receptors and the bacterial mechanisms required for replication and lysis by the phages considered optimal for therapy remain poorly understood. Achromobacter xylosoxidans is increasingly appearing as a pathogen in cystic fibrosis patients across the country and is responsible for more than 10% of cystic fibrosis exacerbations, but its characterization as a pathogen and that of its phages is extremely limited.

Our goal is to use transposon mutagenesis to identify, map, and characterize the receptors and other host factors for Achromophages. A mariner transposon was delivered to the host strain CF116 using conjugation of a suicide plasmid. Only transposons that have been inserted into the chromosome will be inherited stably. Selection of phage-resistant mutants within the pool of cells with transposon insertions was achieved by growth in the presence of different phages. Phage-resistant bacteria that possess a transposon insertion in a gene essential for phage lysis, producing phage resistance, are characterized in several ways including for growth properties, resistance to a series of antibiotics, and sequenced to identify the location of the transposon insertion and thereby the likely disrupted bacterial gene required for phage lysis. Each mapped transposon insertion will be further validated using complementation with the relevant wild-type gene. Subsequently, phage suppressor mutations will be isolated to elucidate the functional relationship between the pair (or pairs) of host and phage genes.

A better understanding of phage-host interactions will allow for more effective deployment of phages for therapy, including a more educated use of different phages and the order of delivery, not only to target the initial pathogenic bacteria, but also to select mutations that will severely reduce their fitness and thus make them more sensitive to clearing by the patients' immune system.

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281 10:50 am

Investigating the Impact of the Sexually Transmitted Parasite Trichomonas vaginalis and Pyroptosis on the Cervicovavaginal Bacteria Lactobacillus crispatus

Ty'Tianna Clark, Cellular and Molecular Biology (M)

Trichomonas vaginalis is a protozoan parasite that infects the genitourinary tract, and is the most common cause of non-viral sexually transmitted infections. Lactobacillus crispatus is a bacterium that plays a key role in promoting female reproductive health. Lack of L. crispatus predominance in the female cervicovaginal microbiome is associated with increased risk of T. vaginalis infection. Little is known regarding how T. vaginalis infection affects L. crispatus colonization in the female reproductive tract. We hypothesize that the inflammatory cell death called pyroptosis that is activated during T. vaginalis infection and T. vaginalis itself exert antibacterial effects on L. crispatus. To test the direct effect of T. vaginalis on L. crispatus, we co-incubated both microbes and then assessed L. crispatus viability by measuring L. crispatus colony-forming units (cfus). The presence of T. vaginalis led to a statistically significant reduction of L. crispatus cfus by 46% and 59% at 30 minutes and 1.5 hours of co-incubation, respectively. To visualize the interaction between T. vaginalis and L. crispatus, we performed scanning electron microscopy. We found that at 30 minutes of co-incubation T. vaginalis bound L. crispatus. Lastly, pyroptotic cell death is mediated by caspase-1 cleavage of the gasdermin D protein, generating an N-terminal cleavage fragment that forms membrane pores in the host cell. The cleaved gasdermin D N-terminal fragment can also be released from the host cell and has antibacterial activity. To investigate the potential antibacterial effect of gasdermin D on L. crispatus, we are in the process of purifying recombinant full length gasdermin-D and the N-terminal gasdermin-D cleavage fragment. An update on this work will be presented. Together, these studies will generate novel knowledge about the effects of T. vaginalis and pyroptosis on L. crispatus colonization, increasing our understanding about how T. vaginalis infections mechanistically drive alterations of the cericovaginal microbiomes of women experiencing trichomoniasis and the potential therapeutic need to replenish L. crispatus in these women.

Session E-5

Oral Humanities, History, Literature, Philosophy 5

Saturday, March 5, 2022, 10:00 am

Location: Mata'yuum

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282 10:05 am

Yearning to Breathe Free Air: Black Towns in the American West, 1870-1920

Kayla Daniels, History (M)

This research examines the transformation of African American communities in the aftermath of Emancipation. Focusing on the formation of the Black Town Movement, it seeks to understand the political, cultural, and economic factors that shaped the geographic and institutional orientation of free Black communities and their relationship to the state and notions citizenship. By examining four significant Black towns in the American West (Allensworth California, Nicodemus Kansas, Boley Oklahoma and Langston Oklahoma), this work hopes to explore how the concept of an expanding American frontier both merged with and deviated from African American articulations of freedom and autonomy amid a rapidly changing environment. Ultimately this work is concerned with how the Black institutions and communities formed in this period cultivated a collective Black consciousness that mitigated against the violent waves of racial disenfranchisement and primed a new generation of African Americans to support radical notions of self-determination at home and abroad by the mid twentieth century.

This work is critical because it reframes, and challenges common perceptions of the Post Reconstruction period. Rather than focusing on the violence and dispossession that characterized this era, a new sense of Black agency and autonomy is gained as we examine the interior worlds Black communities forged 'behind the veil'.

Primary sources from the Kansas Historical Society Digital Archives among others, have been essential for uncovering early patterns of Black migration and community development towards the end of the Reconstruction period. Using Nancy Fraser's theory of subaltern counterpublics along with textual, psychological, and structural methods of analysis strengthen the work by demonstrating the impetus for the building, sustaining, and decline of these communities over the course of decades.

It is hoped that this work will contribute to the growing body of literature on the composition, function, and ideological makeup of historic Black communities in the late nineteenth and twentieth century and elucidate the contours of Black resistance and agency.

283 10:20 am

Image Making, Visual Culture, and Abolitionism

Briana Betschart, History (M)

The United States of the nineteenth century was vying to construct a national identity during a period of rapid cultural and political changes. Abolitionists demanded inclusion into our national polity and worked tirelessly to achieve their vision. As the country grappled with its forming identity, a powerful tool emerged to make image-making accessible to image-makers and consumers. Technological advancements such as photography in the form of the daguerreotype would have momentous effects on the visual culture of the United States.

Images became "contested terrain" because of their persuasive nature. This "contested terrain" captured all the ways that African Americans struggled for autonomy. Images were used to dehumanize as well as humanize; they were used to gain political, cultural, and material support. Images reflected and projected the layered identities of the enslaved seeking freedom, of free persons seeking the full rights and privileges of citizenship, as well as an expression of gender and how it was situated in these contexts. The cultural and political impact of photography and image-making on the Abolitionist movement was immense.

This research seeks to illuminate how image-making and photography were utilized in the service of the abolitionist movement. Within this exciting intersection of study several themes emerge in my study: how abolitionists and artists used imagery throughout the history of the movement, the agency abolitionists employed through pictures and image-making to not only eradicate the evil of slavery but to produce images that depict their humanity, the construction of identity and its relationship to whiteness and class, and lastly how gender was situated in these contexts.

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284 10:35 am

Shaping change beyond the carceral: Octavia E. Butler's Parable series as a tool of abolition

Jenna Wilson, Women's Studies (M)

In the summer of 2020, a resurgence of protests to defund the police led to an increase in public awareness of the critiques of the United States' criminal legal system. More and more, people were arguing that the police and prison systems were racist institutions and the conversation around prison abolition seemed to reignite. With that said, as a movement that calls for a complete restructuring of society as we know it, abolitionists must always be looking for new ways to call people in and expand the coalition. In my thesis, I argue that Octavia E. Butler's Parable of the Sower (1993) and Parable of the Talents (1998) are abolitionist tools that expose carceral logics and demonstrate how they organize the social world. "Carceral logics" is meant to incorporate all practices of discipline, punishment, surveillance, and incarceration by institutions, state actors, and individuals that are used to control populations through physical, technological, and ideological means. Further, I argue that some of the social formations that show up in the Parable series provide clear examples of what safe, accountable, liberated communities might look like through networks of care, mutual aid, and solidarity. Lastly, I consider how the Parable novels elucidate some of the guiding principles of an abolitionist framework. In addition to a close reading of the novels, I will include interviews with Butler to further contextualize my work. I will also uncover how the historical context of the 1980s and 1990s—a time at which the prison industrial complex proliferated at an unprecedented rate—influenced her writing. While many of the ideas around both carceral logics and community building are not new, my argument is that the Parable series and the themes that it invokes can provide us with new pathways for approaching the conversation, can help to reach new people, and can help to change the minds of many by reorienting in a "made up" world, which, in some ways, operates beyond the confines of the world we know today. Without a wide-scale prison abolition movement, it will be near impossible to dismantle the prison industrial complex or address the ways in which carceral logics extend beyond the prison walls. A liberated world is not possible without dislodging the hold that the prison system, an institution that upholds white supremacy, has on our society.

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285 10:50 am

Bottles on the Shore: Prohibition in San Diego, California

Alec Whitson, History (M)

This presentation will focus on the history of Prohibition in the city of San Diego, California, and how alcohol control measures during this period were tied with local efforts to sell the world an idyllic image of San Diego, and thereby attract wealth, influence, and tourism. This presentation will argue that the prohibition experience for San Diegans varied largely along class and racial lines, with middle to upper class white tourists or locals able to enjoy the fruits of the "roaring twenties" while those that did not fit in these categories bore the brunt of Prohibition enforcement efforts. Using a litany of printed records, including arrest records, newspapers, records of Prohibition agents, as well as oral histories, etc, this presentation will show that Prohibition in San Diego was no "party", nor were the greatest excesses and tragedies of the period confined south of the border.

Session E-6

Oral Business Economics and Public Administration / Education 3 Administration / Education 2

Saturday, March 5, 2022, 10:00 am

Location: Aztlan

286 10:05 am

Open Innovation Platform Design: The Case of Social Product Development

Vanessa Roy, Management Information Systems (U)

Open Innovation as a new product development strategy has been used by businesses for decades. However, Social Product Development (SPD) has recently been introduced and popularized as an open innovation business model. The SPD model formalizes and monetizes the collaboration between an organization and creative communities through introducing new products and services. Either managed by intermediaries or directly by innovation sponsors, SPD platforms enable and support online innovative communities to ideate, collaborate, and network. Despite their abilities, many of these platforms do not provide fulfilling user experiences. To bridge this gap, the present study focuses on how SPD platform developers can offer more robust user interfaces (UI) and engaging user experiences (UX) alongside the six key SPD processes—social engagement, ideation, experiential communication, social validation, co-development, and co-commercialization. Building on experience and affordance theories, we offer a design framework that can more broadly inform the design and evaluation of open innovation platforms.

287 10:20 am

Framing the Coast Guard on Social Media: Exploring Organizational Identity, Legitimacy, and Public Perceptions

John Beal, Mass Communication and Media Studies (M)

The U.S. Coast Guard public affairs organization uses social media to report on the service's unique identity as both a military branch and federal law enforcement agency within the Department of Homeland Security. The effectiveness of social media on influencing knowledge, attitudes, and perceptions of online publics is understudied, and data can inform future strategic communication.

This study used a multi-method approach combining textual analysis and a survey to evaluate public perceptions regarding the CG's organizational identity and legitimacy. This was examined from the lens of framing theory. The study explored the frames the Coast Guard applied to communicate its identity and purpose on Twitter and survey respondents' knowledge or perceptions of the service. Findings can inform future strategic communication and public relations research measuring the effectiveness of social media.

288 10:35 am

Social Traveling Platform Design - User Experience Study

Ryan Christian Quiba, Management Information Systems (U)

Tourists increasingly use their mobile phones to plan their trips, get information about various tourist services, and remain in touch with their friends and family [8]. As a result, mobile devices are increasingly being used to book tourist services and hotels. Due to this shift, mobile technology is viewed by the travel industry as a resource that enhances a traveler's experience. It facilitates communication between tourism destination organizers, other tourists, and a range of service providers in various locations [2]. Moreover, with the world becoming more digitalized, people find different ways to enhance their travel experience. Companies have had to adapt to this change and alter their customer-attraction strategies accordingly. As a result, millennials, explorers, and travelers are the major clients for such travel applications [2]. Furthermore, the internet, smartphone applications, and social media have all had an influence on the pre-, on-site, and post-travel stages, causing everyone to become more dependent on them.
In addition, the internet has transformed many aspects of people's lives and the travel industry is no exception, with rapid technological developments changing the sector's operations, particularly in terms of business-to-consumer connections [2]. Due to that connection, it has been shown that individualized experiences from the consumers assist the company via the performance of the app, revenue, and feedback.

Understanding the design and performance elements that lead to app success is critical for a better understanding of user engagement with mobile travel apps. Today's mobile applications share the same issues whether it be complex interfaces, usability, stability, lack of interactive support, and many more. By building context awareness in designing applications, there is also the availability of personalization of each user's experience. The ability to personalize each user's experience is made possible by including context awareness into program design. With this in mind. the application can 'build and maintain a vibrant online community, develop a solid customer relationship, and create a sustainable long-term competitive advantage. Designing a user interface and experience for the case of social mobile travel applications is vital because without the proper design, key features, and user testing will be the app's demise. Our research will go in depth into what features and designs a social mobile travel application must have.

289 10:50 am

Mapping the Everyday Lives of the Houseless

Julia Stasio, Business (U)

Under the direction of Dr. Bruce Appleyard of San Diego State University, the Urban Sustainability, Livability, and Equity (SLE) research team, supported by the Faculty Student Mentorship Program (FSMP) conducted a study with houseless individuals in urban areas of San Diego and Los Angeles. The approach taken to study these dynamics involved conducting cognitive/

image mapping exercises with houseless individuals, based on principles set forth by Kevin Lynch's "Image of the City" (Lynch, 1960).

This research uniquely captures the experiences of the houseless. Principally, we were able to learn about how the houseless perceive the environment of their daily lives – what places are important to them, and what barriers exist. Essentially we were looking at all the critical elements of their home territories – where they find food, water, satisfy their toilet needs, etc. In sum, we captured the key components of what could be considered their homes. Allowing them to subjectively recreate their experiences through cognitive mapping enables us to gain an empathetic understanding of their experiences and an opportunity to address their needs through human-centered design approaches.

To conduct our research we asked houseless individuals to draw maps of their surroundings and daily routines, which were marked with symbols to identify important locations. 112 total maps were gathered - 103 maps (92%) were drawn in the San Diego area and 9 maps (8%) were drawn in the Los Angeles area. From our review of over 100 maps, we have found 13 consistent patterns. One of them is that the houseless often travel in regular routes throughout their day, sometimes using transit or bicycling, but often on foot. This speaks to the need for services to be close to where the houseless live to support their mobility restrictions. Some participants were employed, with some choosing to work for free to help clean the streets or shops they frequented. Parks and alleys were marked as places of importance as they offered safe spaces to congregate and travel through. Some important additional findings include the need for safe storage, adequate public restroom access, and a better relationship with law enforcement.

290 11:05 am

SDSU Fall 2019 & Spring 2020 Transportation Survey Report: Reducing Commute Emissions

Rohan Gidvani, Business Finance (U)

Dr. Bruce Appleyard and his research team conducted a survey examining transportation and carbon emissions during commutes to San Diego State University. As a university, SDSU generates an enormous number of commute trips and high rates of GHG emissions. Therefore, SDSU has a responsibility to implement actions that promote more sustainable modes of transportation and limit the GHG emissions generated.

The purpose of this survey is to provide useful insight on the respondents' transportation behaviors and identify certain problems and areas in which actions can be taken to reduce emissions. The survey consisted of various questions measuring the frequency and mode of transport to SDSU as well as other relevant factors such as residential location, travel comfort/stress levels, parking costs availability, etc. The survey was conducted across two semesters at SDSU (Fall '19 & Spring '20), sent to students, faculty, and staff, and compiled a total of 4,687 responses.

The average commute distance was recorded as 11.6 miles and average commute time as 24.75 minutes. For Fall'19 semester, the three most used modes of transportation were: Driving alone (47.3%,) Walking (19%,) Public transportation Trolley & Bus (12.7%.) For Spring20 semester: Driving alone (49.7%,) Walking (18.3%,) Public transportation (11.1%.) This decrease in public transportation and walking, as well as an increase in driving alone, is an issue that needs to be addressed since it leads to higher emissions generated. This problem may be attributed to the lower comfort levels experienced on public transportation. According to the survey, respondents scored an average comfort level of 3.5/5 when commuting in general. This average drops to 2.6/5 when commuting on public transportation (a 26% decrease.)

In order to make public transportation and other sustainable modes of transportation viable, SDSU can work to improve the quality of public transportation, incentivize other modes, work on changing other factors such as providing housing nearer to campus, or changing parking costs and availability. This study further examines the survey results through different contexts such as gender, school year, position, and location.

291 11:20 am

Limiting Factors of Open Innovation Success: A Case of Social Product Development and Research Agenda

Summer McGuckin, Marketing, Specialization in Integrated Marketing Communications (U)

Open innovation models have grown in popularity as a new method of product development. While open innovation models offer many benefits, they hold a high failure rate. This paper identifies limiting factors that contribute to this high failure rate at three levels, strategy, process, and community. These factors are validated through a case review of a Social Product Development firm. Accounting for these limiting factors, the paper offers a framework identifying open innovation organizational, technological, operational and individual success factors and their relationships. This framework offers a better theoretical understanding of open innovation limits and provides practical recommendations toward their sustainability and triumph.

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Abstracts of Presentations

Session F

SAN DIEGO STATE
UNIVERSITY

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Session F-1

Poster Behavioral and Social Sciences 12
Friday, March 4, 2022, 9:00 am
Location: Montezuma Hall

292 9:00 am A

Metalinguistic awareness on an English vocabulary task for bilingual college students with and without a history of Developmental Language Disorder

Melissa Separa, Speech, Language and Hearing Sciences (U)

PURPOSE. About 21% of the US population speaks a language besides English at home, and about 7% of children have developmental language disorder (DLD). Though DLD is identified in childhood, it persists into adulthood. The current study investigates bilingual adults with and without a history of DLD (HxDLD, noDLD) and their metalinguistic awareness strategies for academic learning. We hypothesized that HxDLD participants might rely more on cross linguistic lexical associations (e.g., similar word forms in two languages such as cognates: elefante-elephant) than their peers due to challenges related to DLD (e.g., difficulties in learning words).

METHOD. Twenty-four college-aged Spanish-English bilingual students (HxDLD=5, NoDLD=19), completed the Cognate Awareness Task (August et al., 2003), where they were given a target word and asked to choose one of four words that best matched its meaning. After, participants explained their answers in a Think Aloud Protocol (Ericsson et al.,1993). Data were coded for metalinguistic associations identified in Candry et al.(2017), including Cross Lexical Associations (CLA), Word Form Comparisons (WFC), Sound Symbolic Associations (SSA), Morphological Associations (MA), and Idiosyncratic Associations (IA).

RESULTS AND CONCLUSION. There was a difference between groups for CLA, Φ=0.41, p=.04, with more CLAs in HxDLD (0.6 or 3/5) than NoDLD (0.16 or 3/19) participants. There was also a higher percentage of CLA responses within HxDLD participants (3%) than NoDLD participants (.5%), U(19,5)=24, z=-2.2, p=.03. HxDLD and NoDLD participants had similar percentages of responses that demonstrated WFC, SSA, MA, and IA strategies, all ps>.05. Qualitative results further elucidate the influence of CLA in Spanish for word recognition on this English task. Although there were no strategy differences between groups, HxDLD participants were more likely than their peers to reference Spanish vocabulary on an English task, reflecting positive crosslinguistic influence on word recognition. These findings add to the bilingual literature on supporting the heritage language.

293 9:00 am B

Measuring accuracy of treatment targets through visual analog scales following phonological intervention

Alicia Escobedo, Speech, Language, and Hearing Sciences (D)

Background

Measurements of effectiveness are a critical component of intervention. For children with speech sound disorders participating in phonological intervention, one measure of intervention effectiveness is the percent accuracy of an intervention target. This percent accuracy requires listeners to make a binary judgment of whether or not a target was produced correctly. However, percent accuracy of targets often does not capture subtle changes that children make throughout intervention (Munson et al., 2012). For this reason, previous research has proposed the use of visual analog scales to measure children's progress throughout intervention, as it allows for the measurement of finer changes (Munson et al., 2012). The current study investigates the use of visual analog scales to measure intervention effectiveness with five young Spanish-English bilingual children who received Spanish phonological intervention.

Methods

All participants (n = 5) were Spanish-dominant bilinguals between the ages of 4 and 6. Inclusionary criteria were having at least five phonemes or consonant clusters in error (Evaluación de la Fonología Española; Barlow & Combiths, 2019) and performing within normal limits on a non-verbal intelligence assessment (Leiter International Performance Scale-Revised, Roid & Miller, 1997). All participants completed up to 18 intervention sessions, or until they reached the mastery criteria for their intervention target. Each participant was assigned an intervention target based on sounds missing from their phonological system.

Each session began with a review of words with a participant's intervention target, with a total of 18 opportunities to produce the target. Participants' productions were immediately scored by the treating clinician and observing research assistant as accurate or inaccurate. For the present study, digital recordings of these sessions were reviewed to allow for scoring using a visual analog scale for each session

Expected Results

We expect the visual analog scale to reveal changes that children made throughout intervention not captured by percent accuracy of intervention targets. This study will provide valuable information on the use of visual analog scales to create more accurate reflections of children's progress through intervention.

294 9:00 am C

Configuration and Engagement During Novel Word Learning in School-Aged Children

Makenna Sine, Speech, Language, and Hearing Sciences (U)

School-age children learn around 3,000 new words a year but are only explicitly taught ~400 of those words (Miller & Gildea, 1987). That means that the vast majority of new vocabulary is acquired incidentally, or through reading or hearing the new words in context. The process of word learning includes three stages: 1) triggering, 2) configuration, and 3) engagement (Leach & Samuel, 2007; Storkel, 2011). There remains a limited understanding of these stages during incidental word learning in school-age children who are undergoing a period of rapid vocabulary growth. This study analyzes the distinction between the configuration and engagement stages during incidental word learning in school-age children. For this project, we collected data from 48 monolingual children with no history of language or learning deficits. Children were asked to perform two experimental tasks to examine the word learning stages of interest. Participation took place remotely using LabVanced and Zoom. The first task, a learning task, was designed to assess the configuration stage. This task required the children to read three sets of sentences (sentence triplets) that ended with the same novel word. Sentence triplets came from one of two conditions: a Meaning condition that established meaning for the novel word or No Meaning condition that did not establish meaning for the novel word. To assess learning, the children were asked to provide a meaning for the novel word. The second task, an identification task, isolated the engagement stage from the configuration stage. For the identification task, children were provided with four pictures of objects paired with a novel word that was presented during the learning task. The children were asked to identify which picture represented the meaning of the novel word. Data analysis will focus on the participant's responses during the learning and identification task. I hypothesize that children will perform better on the learning task compared to the identification task but that children will have similar error patterns on both tasks. I do not anticipate a distinction between the performance of tasks and ages (10 vs 11 vs 12).

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295 9:00 am D

Reliability of Speech Sound Transcriptions in Teletherapy

Amanda Laird, Speech, Language, and Hearing Sciences (U)

Speech-language pathologists (SLPs) are responsible for documenting speech sound production during assessment and intervention for children with speech sound disorders (SSDs). Because children with SSDs frequently produce speech sound errors, transcribers often encounter infrequent or unfamiliar speech sounds when processing their speech samples. This can lead transcribers to be less accurate in their notation of the child's productions. Analyzing reliability between multiple transcribers of the same speech sample can address this issue, as it provides multiple sources of evidence to support claims about a child's speech sound accuracy. High-quality audio recordings of children's productions additionally support accurate transcription, providing the opportunity for SLPs to refine their transcriptions and seek input from others.

Little research has been done on the reliability of transcriptions obtained from modern virtual mediums, such as Zoom, which have been used more frequently since the COVID-19 pandemic, due to increased need to provide teletherapy services. The current study analyzed the reliability of transcriptions documented from both live and recorded Zoom teletherapy sessions. Ten children's diagnostic assessments were transcribed by two judges. For five clients, both transcribers attended the sessions live (via Zoom) and transcribed the child's productions in real time. For the other five, Transcriber 1 transcribed live, while Transcriber 2 transcribed off-line, from a recorded video of that session. Point-to-point reliability was calculated for each set of transcriptions. The criterion for sufficient reliability was 80% agreement.

Results indicated that both methods produced similarly reliable results. Only one set of transcriptions (live/recorded condition) fell below the 80% criterion, receiving a reliability rating of 75%. The low score may be attributed to the child's age and his particularly high rate of speech sound errors. Of all participants, this child was the youngest (3 years, 3 months), and had the lowest percentage of consonants correct (45%). Overall, results show comparable and high reliability, regardless of whether transcriptions occurred on- or off-line. These findings have strong clinical implications: Clinicians and researchers working with children with SSDs through teletherapy have multiple avenues for capturing reliable transcriptions and accurately evaluating performance on speech sound probes.

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296 9:00 am E

Explicit Repetition Priming in Treatment of Anomia

Stephanie Wan, Speech, Language, and Hearing Science (M)

Aphasia is a language disorder commonly caused by damage to the brain's left hemisphere and affects a person's ability to produce and understand language. Oftentimes, people with aphasia experience anomia, or difficulty with accurately naming objects. Research suggests that naming can improve following treatment that repeatedly pairs pictures with their written names, through a mechanism called priming, but these studies have engaged just a few participants. The study described here tested the efficacy of this repetition priming treatment in a larger sample. Also, prior studies have trained a single picture for each target word; for three of our four participants, we sought to explore the effects of using multiple exemplar pictures for each word.

Four participants with aphasia as a result of a left hemisphere stroke were included in this single subject design. Before treatment, each participant attempted to name pictures presented on a computer over seven baseline sessions. Researchers used baseline performance to create individualized sets of pictures each participant was familiar with but could not reliably name. Participants received 12 treatment sessions where they named 20 pictures (Trained; T) after being repeatedly shown each target word paired with the target picture (either one or four exemplars). Ten control items (Untrained-Exposed; UE) were also included and seen during treatment but without prime words. Post-treatment and maintenance testing (3 months after treatment) involved participants naming the T and UE pictures without primes, in addition to 10 additional control items not seen during treatment (Untrained-Unexposed; UU). Effect sizes were calculated (Cohen's d) to compare naming accuracy immediately post-treatment and at maintenance with pre-treatment accuracy. Post-treatment, medium and large effects (d = 4.35-19.02) were observed across participants for

T and UE pictures, with T items having a larger effect than UE items. For UU items, two participants exhibited small effects and two exhibited no effect. Maintenance data were variable across participants: 3 participants varying from small to large effects for trained items and 3 other participants with no effect for untrained items. These results provide further support for using explicit priming to improve naming abilities in adults with aphasia.

297 9:00 am F

Telepsychiatry for Children and Youth; The Challenges and Benefits

Maryhanna Leraas, Child and Family Development (U)

Statement: The COVID-19 pandemic shut down many in-person services, necessitating adaptability in a virtual world. The San Diego Clinic for Child and Youth Psychiatry (CCYP), which provides psychiatric support and medication management services for children who completed psychotherapy and whose medication regimen is too complex for a Primary Care Provider (PCP) to manage, moved to strictly virtual services in the past year, which undoubtedly expanded the program's impact and capabilities. Despite having experience in providing partially online services pre-pandemic, this virtual format fostered occasional challenges. This project analyzes the challenges and benefits of the CCYP program in the online format by evaluating feedback from different stakeholders.

Methods: The data were collected from Zoom interviews with 5 CCYP psychiatrists and 3 families, as well as feedback surveys with closed/open-ended questions (client feedback survey with 45 completed; caregiver feedback survey with 60 completed; caregiver telepsychiatry survey with 69 completed; staff feedback survey with 13 completed). Data analysis methods included elements of the Rapid Assessment Process for psychiatrist interviews, open coding for open-ended survey questions, and descriptive statistics for close-ended questions.

Results: Psychiatrists identified many strengths in using a virtual platform: a unique window into the at-home lives of clients, greater flexibility in scheduling and location, a decreased no-show rate. Two major challenges identified by psychiatrists were not being able to easily obtain vitals and labs and the inability to connect with clients and families that can otherwise occur in in-person interactions. Families had similar answers: virtual services foster a newfound flexibility and accessibility to necessary psychiatric support in the transition away from weekly psychotherapy services. Nearly half of client families expressed their preference for telepsychiatry services, while others prefer a hybrid.

Conclusions: These results indicate that child telepsychiatry services are acceptable to both staff and clients/families; yet some challenges do remain.

298 9:00 am G

Exploring Benefit Finding Among Children and Adolescents with Craniofacial Conditions: A Qualitative Analysis

Megan Korhummel, Psychology (U)

Benefit finding (BF) is defined as the positive change or influence on one's life that can result from adversities. BF in chronic illness populations can help patients adjust to illness-related psychosocial stressors. Children and adolescents with craniofacial conditions (CFCs) are faced with adverse behavioral, emotional, and social challenges, but the possibility of positive change or personal growth associated with CFCs has yet to be examined. Identifying any perceived benefits associated with CFCs in pediatric patients and their family members may assist in the development of resilience and coping. This study aimed to identify benefits perceived by either the child or parents resulting from the child's CFC. A qualitative analysis was conducted using the interviews of 122 children and adolescents with CFCs or their parents. Qualitative interviews were conducted in English or Spanish and discussed topics that included quality of life, school, hobbies, family, surgeries/treatments, and the child's future. Seven categories of benefits were identified in the interviews and after conducting a literature review of BF themes in other chronic illness populations. These include: 1) personal growth, 2) social relationships, 3) empathy towards others with similar challenges, 4) spiritual/religious beliefs, 5) material/external gains, 6) personal health, and 7) philanthropy. Three subthemes in personal growth included a) personality/character, b) self-acceptance, and c) philosophy/outlook on life. The six subthemes in social relationships reflected who else is involved in the identified benefit: family, friends/peers, community, healthcare professionals, educators/school staff, or unspecified/ people in general. Both parents and children identified multiple examples of benefits, such as the development of empathy towards people with and without disabilities, creating closer relationships with others or their religion, and an increase in the child's confidence. These findings can be used to inform future interventions that promote adaptive responses in children with CFCs and their families.

Session F-2

Poster Behavioral and Social Sciences 13
Friday, March 4, 2022, 9:00 am
Location: Montezuma Hall

299 9:00 am H

Anxiety and depression in middle-aged and older adults with and without autism spectrum disorder

Elizabeth Fenelon, Psychology (U)

Introduction: Anxiety and depressive disorders are known to have increased prevalence in Autism Spectrum Disorder (ASD), necessitating treatment and interventions for these individuals. One group reported little variance in prevalence rates across the lifespan, but research on changes during adulthood remains limited. Our study aimed to examine these effects in middle-aged and older adults with and without ASD. Consistent with prior literature, we hypothesized that these adults with ASD would have higher scores in anxiety and depression than typically developing (TD) adults, and that there would be no association between age and anxiety or depression for the ASD group. Methods: Thirty-six participants with ASD and 43 TD controls aged 40-69 years were included (Table 1). All participants completed the Beck Anxiety Inventory (BAI) and the Beck Depression Inventory (BDI) and total t-scores from each were used for analyses. We conducted two t-tests between groups on BAI and BDI, and tested for correlations between age, BAI, and BDI within the ASD group. Results: Adults with ASD had higher BAI scores (M = 10.39) than TD participants (M = 1.98); t(76) = 4.89, p < 0.001. Adults with ASD also had higher BDI scores (M = 11.43) than TD participants (M = 3.67); t(76) = 4.01, p < 0.001. For ASD participants, age was not significantly associated with BAI scores r = -0.317, p = 0.068, nor was it associated with BDI scores r = -0.319, p = 0.071. Discussion: The adults with ASD had higher BAI and BDI scores than TD adults, indicating that even at an older age, those with ASD may be more anxious or depressed than their TD peers. This is consistent with prior research demonstrating that anxiety and depression may be more prevalent in older individuals with ASD than those without. There were no significant associations between age and BAI or BDI for the ASD adults, although the results trended towards negative associations. It therefore remains possible that an increased sample size or incorporation of additional variables such as sex or ASD symptom severity may improve model results and reveal subtle effects.

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300 9:00 am I

BOLD signal variability and its relationship with cognitive performance and anxiety symptoms in Autism Spectrum Disorder

Naomi Meave Ojeda, Psychology (M)

Background: Anxiety symptoms are common in individuals with Autism Spectrum Disorder (ASD) and have been associated with reduced executive function and cognitive flexibility. Variability of the blood oxygen level-dependent (BOLD) signal as measured by fMRI has been found to correlate positively with cognitive function in healthy adults and predict treatment outcome in patients with social anxiety disorder. In children and adolescents with ASD, BOLD signal variability did not differ from a typically developing (TD) group (Easson & McIntosh, 2019) but its relation with co-occurring anxiety symptoms and cognitive function in ASD has not been investigated.

Methods: The Screen for Child Anxiety Related Disorders (SCARED) was completed for 42 ASD and 28 (TD) participants (aged 12-21 years) who performed a lexico-semantic decision task during fMRI. Groups were matched on age, gender, handedness, non-verbal IQ, and in-scanner head motion (RMSD). Group differences in BOLD signal variability were examined in regions of interest derived from the Harvard-Oxford atlas using ANCOVAs (covarying age and RMSD). Associations between BOLD signal variability and anxiety symptoms in the ASD group were further examined using partial correlations controlling for age and RMSD.

Results: ASD participants scored significantly higher on all SCARED measures, with 22 ASD participants, but only 2 TD participants scoring above the screening cutoff for an anxiety disorder. Accuracy on the task was significantly correlated (p<.05) with several SCARED subdomain scores (School: r=.37; General Anxiety Disorder (GAD): r=.311; Total: r=.309). Results showed that BOLD signal variability did not differ between groups, but significantly correlated with anxiety symptoms in multiple regions in the insula and frontal, temporal, and occipital cortices. These correlations remained significant when further controlling for ASD symptom severity.

Conclusion: Our results indicate that anxiety symptoms in adolescents with ASD are associated with accuracy and BOLD signal variability during a cognitively demanding task. Consistent with the only previous finding on BOLD signal variability in ASD, we found no differences between the ASD and TD groups. Nevertheless, these findings show that BOLD signal variability exhibits some sensitivity in detecting differences related to anxiety symptoms in ASD.

301 9:00 am J

Links between poor sleep in the first year of life and later neurocognitive outcomes in young children with autism

Adriana Rios, Psychology (U)

Children with autism spectrum disorders (ASD) commonly experience sleep problems. To better understand how sleep problems in ASD affect brain and cognitive development, we tested if irregular sleep in the first year of life predicts neurodevelopmental outcomes at the preschool age. Data from 72 children (1.5 to 5-year-olds) with ASD and 41 typically developing (TD) children (matched at group level on age and sex) enrolled in the longitudinal SDSU Toddler MRI Project were analyzed. Developmental, Medical History, and assessments of child's developmental skills were obtained from caregivers-including the Vineland Adaptive Behavior Scales, Sensory Profile, Child Behavior Checklist, and functional magnetic resonance imaging (fMRI) data were acquired during natural sleep. Consistent with prior literature, irregular sleep during the first year of life (reported by caregivers) was more common among children with ASD (p=0.015). In the ASD group, those with irregular first-year sleep (n=26 [FYS]), compared to those with regular sleep (n=46), had significantly (p=.05) greater sensory sensitivities, persisting sleep problems, and lower developmental skills at the preschool age. Next, we investigated if irregular FYS is linked to functional brain network organization at the preschool age in a subset of children with ASD and usable fMRI data (n=45). Functional connectivity was assessed between 30 regions of interest forming 7 canonical functional brain networks (derived from the Human Connectome Project).

Children with ASD and irregular FYS had significantly more idiosyncratic functional

brain network organization (Cohen's d=1.05, p=.001) compared to children with ASD and regular sleep, with stronger connectivity between regions in the default mode and sensory networks, and weaker connectivity between regions in the dorsal attention, salience, and fronto-parietal networks (analysis of covariance [ANCOVAs] controlling for age and in-scanner motion; p<.05 FDR corrected).

These results demonstrate that, in young children with ASD, poor first-year sleep is linked with lower neurocognitive outcomes throughout the preschool age, including heightened sensory sensitivities, lower developmental skills, and atypical functional brain network organization across several large-scale brain networks, highlighting the need for early and targeted interventions to improve sleep in young children with ASD.

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302 9:00 am K

Examining the Relationship between Childhood Trauma and Anxiety in Older Adults

Cassandra Ortiz-Nelsen, Public Health (U)

Background

Stress and anxiety are increasingly common in the United States, but it may be more common for those who have experienced trauma in their lives before adulthood, while the brain was still developing. A study published in 2016 by the United States Department of Health and Human Services suggests that trauma can result in cognitive impairment as well as other problems. * The relationship between anxiety across the life course and childhood trauma is lesser-known in the field of social and behavioral science. This research study examines the relationship between childhood traumas and anxiety symptoms in older adulthood. Within those who have reported childhood trauma and symptoms of anxiety, certain minority groups are significantly affected. The second priority of this study is to unveil these subgroups to find out who is affected by the relationship between anxiety and childhood trauma.

Methods

Using the HRS (Health and Retirement Study) data set from the year 2010 (MLB), there are 4952 participants of black, white, and Hispanic ethnicities/races of both male and female gender/sexes who have self-reported anxiety symptoms by answering five questions, and have self-reported childhood trauma (trauma before age 18) by answering four questions (Q37K-N).

The statistical analysis uses ANOVA, regression linear, and crosstabs tables to compare race/gender with either childhood trauma or reported anxiety.

Results

The ANOVA results show gender but not race differences in childhood trauma (F-value: 32.41, P-value: <0.001). Women have more anxiety symptoms than men in the 2010 study. OLS Regression analysis shows that childhood trauma (before age 18) is a significant predictor of anxiety (P-value: <0.001, B-value: 0.324) controlling for race and gender.

Conclusion

There is a difference in the experienced childhood trauma depending on sex. There is a difference in reported anxiety depending on sex and race. When thinking about anxiety over a lifetime, trauma is a significant predictor regardless of race. In future studies, it may be important for women's health to research the effect that chronic stress and race discrimination has on levels of self-reported anxiety.

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303 9:00 am L

Distress Amongst Latina Breast Cancer (BC) Patients During the COVID-19 Pandemic

Andrea Valadez Galindo, Social Work (M)

Background: The COVID-19 pandemic has seen a rise in psychological distress throughout the U.S. (Wu et al., 2021). Psychological distress was most prevalent amongst women, those of lower social-economic status, and individuals who have a higher COVID-19 infection risk (Wang et al, 2020). Furthermore, research suggests that levels of anxiety and depression have increased amongst cancer patients during the COVID-19 pandemic (Chen et al, 2020). Nonetheless, little is known about distress among Latina BC patients. Given the vulnerability of this "immune compromised group" for COVID-19 infection, it is important to further explore potential distress amongst this population.

Aim: The main goal of the study was to explore the COVID-19 related distress and coping among on Latina BC patients.

Design: This was a qualitative study that 27 Latina BC patients were in-depth interviewed.

Sampling Method: Using purposive sampling, the participants were recruited from a nonprofit organization in San Diego.

Data collection: Data were collected from March 2021 to June 2021, and the interviews took place over videoconference or phone call by the trained graduate research assistant in English or Spanish. Each interview lasted approximately 40 minutes to 1.5 hours.

Data analysis: SPSS was used to calculate the descriptive statistics for the participant's socio-demographic information. Interviews were audio-taped, transcribed, translated. The qualitative data were analyzed using thematic analysis.

Results: The participant's average age was approximately 54 years. More than half (59.3%) had an annual household income of $30,000 or less and closely two-thirds (63%) reported elementary school or high school/GED as their highest level of education. Amongst the participants, stage 2 cancer was most commonly reported (40.7%) and the vast majority had health insurance coverage (96.3%). When exploring distress, the main themes were social isolation, lack of interaction with family members, and worries about contracting COVID-19. As for coping, the main themes were family support, religiosity/spirituality, and self care (i.e., therapy, meditation).

Conclusion: Latina BC patients encounter various challenges and stressors that may negatively impact their mental health.

Therefore, it is necessary for health care professionals to address distress during consultations to approach the patients' needs (i.e., referrals, coping mechanisms) accordingly.

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304 9:00 am M

Zoom University: How the pandemic and online learning has affected SDSU students

Shayan Ebadat, Communication (U)

The COVID-19 pandemic has been a huge transition for everyone, and truly an unprecedented time. This study explores the effects the transition to online and the pandemic has had on undergraduate students, and how they manage these effects. There is very little research done on this topic because the pandemic is still so new. However, studies done on online learning do not provide a positive outlook. It is important to address this topic because the student perspective is often overlooked in literature. With the pandemic there are corresponding mental health crises and epidemics of loneliness. This time in our history is affecting nearly every part of our lives, and we want to know how that is affecting students. We interviewed 8 San Diego State (SDSU) Communication Undergraduates, and examined 10 comments by SDSU students that were made on GroupMe. We found that most students are dealing with anxiety and depression, but one student actually had positive impacts on their mental health. Most students do not prefer online learning compared to face-to-face learning, and they feel their learning experience has been hindered. Students feel that professors are not understanding enough, and they are not given the resources they need to succeed. However, some students found benefits in having a more flexible schedule and saving time and money. Students employed many management strategies to deal with their mental health and online learning. The two biggest being spending time with others, and having great time management. This study can be extended to all U.S. University students to have a better understanding of the student perspective.

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305 9:00 am N

Associations between Life's Simple 7 & White Matter Microstructures in Middle-Age and Early-Old Age

Teresa Warren, Psychology (U)

Previous researchers have found that cardiovascular health risks, as measured by the American Heart Association's (AHA) Life's Simple 7 (LS7), are associated with brain structure. However, few researchers have examined these associations from midlife to early old age. We hypothesized that LS7 scores at midlife will be associated with brain structure, specifically white matter microstructures, in early old age. Participants were 1,608 men who participated in the Vietnam Era Twin Study of Aging. At mean age 62 and 68 (55-67 and 61-72), the LS7 index was assessed. The LS7 index includes smoking, physical activity, diet, body mass index, cholesterol, glucose, and blood pressure and each factor was coded on a 3-point scale (0 [poor]-2 [ideal]) according to AHA criteria. 3 LS7 scores were created: a composite LS7 score (0-14), a categorical LS7 score (poor [-1+ SD from mean]-ideal [+1+ SD from the mean]), and an ideal LS7 score (0-7). Participants also underwent structural and diffusion-weighted magnetic resonance imaging at mean age 68. In unpublished work, we previously found that the people with poorer LS7 scores had brains that were more similar to those of persons with AD, as measured by composite brain signatures. In this project, I use fractional anisotropy (FA), mean diffusivity (MD), axial diffusivity (AD), and radial diffusivity (RD) to examine the hypotheses that midlife LS7 scores are associated with white matter microstructures in early old age. Briefly, FA indicates the directionality and coherence of white matter regions, MD indicates the average water diffusion within brain tissue independent of direction, AD indicates axonal damage, loss of axons, or less coherence in axonal orientation, and RD indicates demyelination. I will conduct analyses that control for age, education, income, ethnicity, and APOE genotype. These findings will enhance our knowledge on the association between cardiovascular risks and brain structure in late life. Identifying modifiable health factors, such as cardiovascular health risks, could potentially benefit older adults by promoting healthy vascular and brain aging, especially for those at risk for AD.

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306 9:00 am O

Arthropod community responses to bison and prescribed fire management in tallgrass prairies

Maricela Alaniz, Biology (Ecology) (U)

Disturbance events can play consequential roles in determining the abundance of species within an ecological community and are important drivers of ecosystem function. In the central U.S., fire and grazing by bison are disturbance events which historically shaped tallgrass prairies. These disturbances have been greatly disrupted but remain important management tools in the little prairie habitat that remains. The interaction of fire and grazing creates variation across a landscape, increasing plant heterogeneity that may affect arthropod assemblages. Fire and grazing have been well studied as management tools for plants, but few studies have focused on the effects of these disturbances on arthropod communities. We assessed how fire and grazing affect arthropod communities by analyzing abundances of 16 arthropod groups from restored and remnant prairies that differed in the presence and absence of bison and recent prescribed fire. Surprisingly, arthropod diversity was decreased by grazing and unaffected by prescribed fire. Bison presence may have amplified the abundances of predominant species leading to reduced community diversity. Individual arthropod groups differed in their responses to both disturbances. Our results suggest that application of both fire and grazing influences arthropods and potentially shapes the ecosystem functions to which these animals contribute.

Session F-3

Poster Biological and Agricultural Sciences 7
Friday, March 4, 2022, 9:00 am
Location: Montezuma Hall

307 9:00 am P

Site age and recent fire influence decomposition more than plant litter source in restored tallgrass prairies

Mareike Lankhorst, Biology with emphasis in Ecology (U)

Decomposition is a key component of ecosystem function that drives nutrient and carbon cycling. In restored ecosystems, examining decomposition can indicate how the restoration and ongoing management activities shape this important function. Management can affect decomposition by changing site microenvironment or through differences in plant composition. We used two experiments to understand if decomposition in restored tallgrass prairies varies with site characteristics (age, bison presence, and recent prescribed fire) or its effects on litter makeup. In the first experiment, we collected leaf litter from different sites and allowed decomposition in a common location for one year. Litter decomposition did not vary with characteristics of the site from which it was collected. In the second experiment, cellulose filter paper samples were placed in each site and allowed to decompose for one year. Filter paper decomposition rates declined with increasing age of a site, and there was a trend for increased decomposition in recently burned sites. Our results indicate decomposition was more strongly influenced by age and recent fire in differing sites rather than different plant litter sources. Differences among sites show that function depends on individual microenvironments, which are determined by land managers' strategies.

308 9:00 am Q

Arctic Permafrost Thaw Depth and Water Table Trends: A Comparison Over Time and Between Sites

Nina Chesnut, Cellular and Molecular Biology (U)

The aim of the project is to determine the seasonal trend of both permafrost thaw depth and water table height in the Arctic tundra for the Summer 2021 season and compare it to historical trends. In order to obtain this data, I employed the use of a permafrost thaw depth stick and water height measuring sticks. The permafrost depth stick is a metal rod, about three feet in length, and about 1.5cm in diameter with a sharpened end. I inserted the stick until it stopped at the top of the permafrost layer and measured the depth. The water height sticks were four-foot-long wooden sticks that were about 1cm in diameter. Along the transect I measured, PVC pipes were drilled into the ground until they reached the top of the permafrost. I would insert the wooden stick into the PVC pipe and measure the water height at that point along the transect. The difference between the water height and the permafrost depth was then recorded as the water table. I did these measurements in tandem along six total sites in the tundra. All transects - barring one - were 260 feet long and I took measurements every two feet. In addition to taking new measurements, I organized the 2005-20015, 2019-2021 permafrost data. I went on to use these measurements to make graphs, and run statistical tests. These were used to find trends and relationships between years with meteorological phenomena. I focused on three sites - BEN, BEC, and BES - in my later data analysis because of the variety of meteorological environments they were in, and the extensive historical data on them. The general trend among thaw depth data shows a gradual thawing in the permafrost that will peak at the end of the season. The conclusion I reached was the 2021 water table and thaw depth trends show a deviation from the median historical data. The water table and the thaw depth were both elevated, BES' peak thaw depth being 4 cm higher than 2019. This may have been in part due to a wetter season than usual.

309 9:00 am R

Chaparral Management Plan of Southern California

Ben Hall, Environmental Sciences (U)

Global climate change brings an array of problems on a global and local scale. It will be important to take action to mitigate and eventually reverse climate change through carbon sequestration. The aim of this study is to bridge the gap between the scientific findings and the implementation of carbon sequestration in the chaparral ecosystem. We looked at what is known about the biome and will create a management plan focusing on maximizing carbon sequestration with solutions that will also improve wildlife habitat, recreational benefits, water yield benefits, and wildfire prevention. The specific points are tailored towards the Southern California chaparral but could be applied to other chaparrals around the world. We hope this plan will play a part in supporting a healthy chaparral while removing carbon from the air and generating carbon-conscious energy for many people.

310 9:00 am S

Bridging the "Conservation Gap" with Population Genetics

Anais Aoki, Bioinformatics and Medical Informatics (M)

Conservation management to mitigate extinction of wildlife becomes more crucial than ever as global impacts due to anthropogenic activities and climate change continue to create devastation for species around the globe. It has been shown in recent studies that there lies a strong disconnect between research and policy, what is known as the "Conservation Gap". This can be accredited to issues such as lack of communication and understanding, hesitation to allocate funding for research, as well as overall lack of research. We conduct a meta-analysis in efforts to bridge this conservation gap and overcome the barriers that lie within the disconnect. Using over 500 published articles focused on conservation and population genetics, sampling across a variety of invertebrate taxa, and using IUCN classifications, we aim to address three important questions. (1) Does observed heterozygosity decrease as species become more endangered? (2) As species become more endangered, are they also becoming more isolated, therefore differentiated between populations? (3) Are the population genetics criteria, such as heterozygosity and differentiation, used by IUCN to rank threatened species good predictors of endangerment? Our study overwhelmingly shows (1) significant ($p << 0.05$) differences in observed heterozygosity within populations across various IUCN levels, specifically showing that species with IUCN status of 4 (endangered) are significantly different in their heterozygosity levels compared to all other levels (1-3,5-6), (2) non-significant differences in degree of differentiation between different IUCN levels ($p > 0.05$), and (3) significant support for IUCN level to be predicted by heterozygosity, Fst, and the order of the species.

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311 9:00 am T

Temporal Assessment Of Tobacco Related Compounds (Nicotine and its metabolites) In California Natural Reserve

SHAHRIN BINTE SALAM, Environmental Health (M)

Tobacco product waste (TPW) has enormous adverse consequences on organisms and ecosystems. Cigarette butts are discarded openly on the sidewalks, streets, and other public spaces from where they can easily be released into various water bodies through runoff of drains. It is the most common form of litter and ubiquitous debris items in outdoor environments such as parks and beaches. Because cigarette filters are plastic that doesn't biodegrade that aren't eaten by fish and other organisms, eventually accumulate on coastlines or at the bottom of the water. Cigarette butts can easily block storm drains and sanitary sewer systems. Wetlands are ecosystems where the land is saturated with water either seasonally or permanently and are important for providing food, clean water, and home for many species including fish, reptiles, and others. Kendall-Frost Reserve is vulnerable to the effects of urban pollution, including TPW, which can contaminate the reserve's ecosystem. The primary aim of this study is to measure the chemical constituents in water and sediment metrics from TPW. Water and sediment samples from seven outfalls from the Kendall reserve were collected through 26 sampling events from November 2019 – to January 2022. The entire study period comprised of three dry and three wet seasons. Among seven locations two of them Noyes St and Olney St outfall are located adjacent to the boundary of the reserve and the rest of those are situated inside the reserve. Liquid chromatography triple quadrupole mass spectrometry (LC-MS/MS) and Solid-Phase Extraction are applied to prepare and analyze the chemical constituents such as Nicotine and cotinine. Nicotine concentration in water in Noyes and Olney St showed an increasing trend during winter/wet season and decreasing trend during summer/dry season, unlike cotinine. Olney St downstream showed a similar increasing trend for nicotine concentration. Crown point villa showed a very clear increasing trend for nicotine and a declining trend for cotinine during winter. This suggests that urban storm runoff during the wet season may be a potential source of nicotine to the reserve, while the cotinine level in the reserve water may represent background contamination from tobacco use.

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312 9:00 am U

What's for dinner? Prey selection of the California spiny lobster

Crisila Aban, Biology (U)

The California spiny lobster (Panulirus interruptus) is an abundant predator of many invertebrates that live along the shallow coastline of Southern California. Lobster predation may help control outbreaks of sea urchins that can remove kelp habitat. Lobsters also may help control invasive bivalve species that alter benthic habitat. However, these functions are affected by lobster preference for different prey species. Previous studies of California spiny lobsters have shown high, but varying, preference for molluscs, crustaceans, and echinoderms, but our current understanding of California spiny lobster prey preference is limited. I tested whether spiny lobsters prefer bivalve prey over urchin prey, and in a separate experiment, whether invasive bivalves are preferred over native bivalves. In my lab experiments, I offered a choice of prey species to lobsters, and used video to determine which prey species lobsters attacked and consumed first. I found that lobsters preferred blue mussels (Mytilus edulis) over purple sea urchins (Strongylocentrotus purpuratus), suggesting that lobsters prefer to consume bivalves that are easier to attack and consume. Video analysis indicated that urchins used shell remnants of mussels to deter lobster predation. In addition, most urchins used spatial refuge effectively to avoid predator detection. Based on the recorded time lapse images, in experiment 2 I found that lobsters preferred invasive Asian date mussels (Arcuatula senhousia) over blue mussels, but that lobsters would readily consume blue mussels as their secondary preference. Preference for Asian date mussels corresponds to studies finding that lobsters may help control this invasive species, providing top-down protection for native communities. My results of this study may add to our understanding in the mechanisms of California spiny lobster prey preference and predator-prey interactions within overlapping habitats, and the importance of lobster predation in maintaining native communities and habitats.

Session F-4

Poster Biological and Agricultural Sciences 8
Friday, March 4, 2022, 9:00 am
Location: Montezuma Hall

313 9:00 am V

Heritability and phenotypic plasticity of body size in the parthenogenetic wasp Dinocampus coccinellae

Scott Monahan, Biology (U)

Dinocampus coccinellae is a solitary, generalist Braconid parasitoid wasp that reproduces by parasitizing an unusually wide range of host ladybeetle species. They have diverse body shapes and sizes across their range of host coccinellid beetles that provide disparate environmental conditions for the parasitoid D. coccinellae larvae to develop under. Here we examine the heritability of body size, and mass and investigate the plasticity or adaptive heritability of body size morphology. Both unilineal (= reared on same host species) and multilineal (= reared on different host species) crosses were performed and total phenotypic variation was quantified using (1) microscopy and geometric morphometrics, and (2) using a microscale. Our study determined low narrow-sense heritable variation across both the unilineal and multilineal parent-offspring regressions, with most regressions returning slopes not significantly different from zero, indicating that the environmental conditions which the larval D. coccinellae parasitoid develops within contribute a strong influence on the body size phenotypes expressed in the offspring generation.

314 9:00 am W

Dried plum bone formation biomarkers in human fecal and plasma samples using high resolution mass spectrometry

Kayla Mari Vale Cruz, Chemistry with an emphasis in Biochemistry (U)

Recent studies have shown the positive effects of dried plum consumption on bone health in young women using hormonal contraceptives. Dried plums are known to be sources of boron, potassium, and phenolic compounds which have been shown to stimulate bone formation. The effects can be visualized through the analysis of the biomarkers chlorogenic acid and caffeic acid conjugates. Chlorogenic acid is a common polyphenol within the human diet and was seen to prevent estrogen deficiency-induced osteoporosis. Caffeic acid conjugates were present in plasma after the glucuronidation or sulfonation of rosmarinic acid, which is known to absorb in bones once applied to skin. Untargeted metabolomics was used to further explore the range of metabolites in both plasma and fecal samples, that have altered expression with this dietary additive. Subjects were divided into a control group administered oral contraceptives with no dried plum and an experimental group administered oral contraceptives with dried plums. Fecal and plasma samples were collected on day 1 and day 21 of the trial. After samples were collected, they were flash frozen with liquid nitrogen and maintained at –80°C until preparation. Fecal samples were pulverized, slurried with LCMS grade water, then mixed with a solution of 50:50 acetonitrile:methanol and sterile filtered. Small volumes of plasma samples were treated with 50:50 acetonitrile:methanol, precipitated, centrifuged and its supernatant extracted. All the samples went through a nitrogen gas dry down and were reconstituted with 50:50 acetonitrile:water. They were then analyzed using high resolution mass spectrometry with reverse phase to determine changes in the production of metabolites by the digestive process. The metabolomics bioinformatics platform XCMS Online was used to perform feature detection, retention time alignment, and statistical analysis to identify dysregulated metabolites in fecal and plasma samples. Significant features found on XCMS were run through the mass spectrometry networking site, GNPS, to determine potential metabolites which will be presented in this poster.

315 9:00 am X

STIs on the Move: Investigating the Role of Motility in Trichomonas vaginalis Pathogenesis

Mariana Padilla, Biology (U)

Trichomonas vaginalis is a protozoan parasite that causes trichomoniasis, a sexually transmitted infection (STI). Although trichomoniasis is the most prevalent non-viral STI, little is known about the pathogenic mechanisms of this extracellular parasite. T. vaginalis motility is driven by the parasite's five flagella. Even though fast parasite motility is one of the most prominent parasite features, flagellar synthesis in T. vaginalis has never been previously investigated. Kinesin proteins participate in anterograde intraflagellar transport (IFT) and are critical for flagellum assembly and function. Analysis of the T. vaginalis genome (TrichDb) for genes annotated as kinesin-2 proteins led to the identification of five kinesin-2 proteins. My research focuses on characterizing two of these genes (TVAG_120610 and TVAG_273680). Utilizing bioinformatic analysis we found orthology with multiple known kinesin proteins. Domain protein analysis using Interpro revealed that both genes have conserved kinesin domains with molecular functions that potentially mediate ATP binding, microtubule binding, and microtubule motor activity. Utilizing Phyre2 analysis we found the two genes have predicted tertiary structures similar to kinesin-2 proteins in other eukaryotes. Additionally, Phyre2 analysis identified the presence of conserved kinesin domains in other unicellular eukaryotic parasites including Giardia intestinalis and Plasmodium falciparum. We are now in the process of cloning these genes to express them in T. vaginalis, in order to first test if they are localized within the flagella. After we assess their cellular location, we will knock them out to determine their contribution towards flagellum assembly and assess how loss of parasite motility affects the immune response to the parasite. An update on this progress will be presented. Our findings will reveal novel knowledge about flagella biogenesis in T. vaginalis and provide new information regarding the contribution of T. vaginalis motility towards pathogenesis.

316 9:00 am Y

Microbiome and virome analysis reveals distinct differences in IBD communities versus healthy communities

Cole Souza, MS Microbiology (M)

Inflammatory bowel disease encompasses two conditions, Crohn's disease (CD) and ulcerative colitis (UC), and is characterized by inflammation of the gastrointestinal tract. These diseases are correlated with a decrease in the microbial diversity in the gut. Much is known about the role of the microbiome in IBD, but the role of the virome is poorly understood. We hypothesize that the virome plays a central role in modulating the microbiome and therefore has an impact on disease state and progression. To address this, we are culturing bacteria from patient and house-hold control (HHC) fecal samples in anaerobic and aerobic conditions. We are using these cultures to grow and characterize bacteriophages found in the gut of healthy versus diseased individuals. The isolation and characterization of anaerobic bacteriophages remains difficult due to the anaerobic nature of the gut. One hypothesis we are considering is that anaerobic metabolism does not produce sufficient energy to support high levels of lytic growth and phage plaque formation. Sequences of anaerobic virus reference sequences are very few and thus virus identification by metagenomics is difficult. In this presentation, we will show how we have isolated bacteria and created lysates from the stools of IBD patients and matched healthy individuals using both classic and enrichment strategies. Furthermore, we are comparing wet lab results with sequencing data from the same fecal samples. Using bioinformatics, we analyze and compare the viromes of IBD versus healthy individuals to shed light on the differences between the roles of the viromes of IBD and healthy individuals. Our goal is to identify which phages are associated with disease, and the mechanism by which they promote disease or protect from it.

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317 9:00 am Z

Application of Constant Tensional Force Radiating from Nipple and Overlying Skin Alters Mammary Ductal Branching Morphogenesis in Mice

Daisy Ulloa, Mathematic, Emphasis in Computational Science (U)

The mouse mammary gland is made up of two main tissue compartments: the epithelium (which consist of ducts with terminal end buds), and the stroma. Major events such as puberty, pregnancy and lactation are accompanied by remarkable changes in the structure of the mammary gland. At puberty, an extensive tree-like network of branched ducts form from a rudimentary ductal structure. This process is termed branching morphogenesis. This extensive network of branched ducts is connected at its base to the nipple and is important for the production and delivery of milk to the infant. The impact of biomechanical forces on pubertal mammary gland development is not fully understood. In this study, we aimed to understand how tensional forces affect pubertal mammary gland development. At five weeks, the skin surrounding the left abdominal number four mammary gland nipple of 10 female mice were adhered together with surgical glue to create a tensional force (TEN). The contra-lateral (CL) gland (i.e., the right abdominal number four mammary gland nipple) was left alone. After two weeks (7 weeks of age), mice were euthanized, and both the TEN and CL abdominal glands were removed and whole mounts prepared. Ductal morphology of TEN and CL glands were compared to abdominal glands from untreated-control (CTL; n=10) mice. Using image-based analysis, we discovered that the CL glands were significantly longer than the CTL glands. There was no significant difference in the size of the TEN, CL, and CTL glands. Further analysis showed a significant difference in ductal branching angle between the TEN, CL and CTL glands. In summary, this study has found that tensional forces may affect the ductal morphology of the mammary gland without modifying its size.

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318 9:00 am AA

Effects of UV on Antioxidant Production in Hydroponically Grown Phaseous vulgaris

Marley Wilson, Environmental Science (U)

Most current agricultural systems employed around the globe are not sustainable. As the world population grows, urbanization increases along with water use and food production. Growing agricultural demands are not being supported by enough research and development in urban agriculture. Hydroponics is one form of urban agriculture that may support necessary advancements in agriculture. Nutrient rich foods might be better generated using this relatively novel approach. Antioxidants are of particular interest, as they are highly beneficial in absorbing free radicals which can damage important biomolecules such as DNA. In this study, we analyze the effects of ultraviolet radiation on hydroponically grown Dragon Tongue bush beans (Phaseous vulgaris). Ultraviolet radiation is known to be an important factor that induces antioxidant production, yet this has not often been fully tested in combination with hydroponics. To examine the efficiency and quality of hydroponically grown vegetables, as well as the effect of UV on antioxidant production, we grew the Dragon Tongue beans hydroponically under two different greenhouse films. Greenhouse 1 (GH1) allows for most UV rays to pass through to the plants, while Greenhouse 2 (GH2) blocks most UV radiation. The beans in both greenhouses were supplied with identical nutrients, and other factors were also controlled such as temperature, pH, which were held constant and monitored daily. When ready, we will harvest the beans and leaves and compare overall quality (biomass, appearance, yield) as well as levels of nutrients, specifically measuring antioxidant levels. In addition to analyzing the quality of the beans, we are tracking the water usage in both hydroponic systems. Hydroponics are far more efficient in regard to water use and therefore the system we are employing dramatically lowers water consumption rates compared to traditional legume growth. If successful, this research may suggest better conditions to produce optimally nutritious hydroponic Dragon Tongue beans and inspire further research regarding similar experiments with other crops.

319 9:00 am BB

Battle of the Sexes: A Closer Look into Cylindropuntia wolfii's Sexual System

Scarlet Steele, Biology and Philosophy (U)

Commonly referred to as Wolf's cholla, Cylindropuntia wolfii is a species of cactus native to the Southwestern United States and Baja California. Initially identified as gynodioecious (a population that has bisexual and female individuals seperately), we found that the bisexual individuals did not produce any fruits. We then predicted that the bisexual individuals could be functioning as males, thereby defying the rules of a gynodioecy system . To accurately determine the sexual system of C. wolfii, microscopic cross sections across different stages of the cacti's floral development were performed. I utilized the histological technique to preserve specimens in resin, embed, and mount them on the microtome to cut precise slides down to the micron. Using this technique, anthers of both male and female individuals were dyed and then compared under the microscope at 10x, 20x, and 40x in order to study the morphological similarity and differences in C. wolfii's sexes. We found that flowers appearing to be morphologically bisexual aborted the female sexual organs during the development process into mature flowers, therefore actually being functionally male. These flowers show that the ovule degenerates during megagametogenesis, which extends to the nucule as the female sex is aborted. Constrastingly, in femaleflowers, the ovule is able to fully develop but it aborts the the anther (the male sexual organ). Thus the sexual system of the cactus was confirmed to be functionally dioecious instead of gynodioecious which was initially determined based solely on morphology. This raises a concern for other Cylindropuntia species that have morphologically described sexual system as these systems play a role in the species ecology and evolution.

Session F-5

Poster Engineering and Computer Science 5
Friday, March 4, 2022, 9:00 am
Location: Montezuma Hall

320 9:00 am CC

Study of Bench Scale Anaerobic Digesters for the development of improved onsite and mobile sanitation solutions

Elijah Sowunmi, Mechanical Engineering (U)

In developing parts of the world, pit latrines are used in high volume due to reduced costs and space requirements. These systems, though more affordable than flushing toilets, provide inadequate treatment of human excreta, allowing excess nutrients to be released into the environment. These waterless latrines accumulate solids after continuous use, resulting in frequent emptying of their contents. The latrines need to be improved so that solids found inside break down easily rather than building up in the latrine tank. Improved pit latrines would reduce the amount of excess nutrients introduced to the environment. In the Water Innovation and Reuse Lab, unsewered flushing latrines containing water and function like anaerobic digesters, are being developed to fill the need for efficient sanitation in developing communities, refugee camps, emergency relief scenarios, and mobile sanitation solutions.

The purpose of this research is to understand the processes occurring in unsewered flushing latrine systems with respect to the accumulation and treatment of solids and nutrients, including nitrogen and phosphorus. This will prove to be a useful step to improving them for improved environmental and human health and sustainability.

While feeding bench scale anaerobic digesters under four different waste introduction regimes: mixed, unmixed, urine diversion, and discarded toilet paper, the evolution of nutrient concentrations was quantified using colorimetric methods. Gravimetric analysis was performed to quantify changes in the concentrations and composition of solids.

I observed that as I continuously fed the 4 anaerobic digesters synthetic urine, dog feces, and toilet paper, the concentration of total solids increased. The urine diversion tank dissolved concentrations remained lower than in the other three tanks. It was clear that urine largely contributed to the level of dissolved solids in the tanks that contained urine. In the unmixed tank when the supernatant was sampled, there were consistent low measurements of suspended solids.

These results give insight into what to expect when using waterless flushing recirculating toilet systems. Recent work in WIRLab is investigating using such systems incorporated into mobile trailers. These trailers would be a safer sanitation option in multiple settings like homeless encampments, disaster relief zones, and refugee camps.

321 9:00 am DD

Cultivating Anammox Bacteria Using an Anaerobic Baffled Reactor to Effectively Treat Wastewater

Elisa Rivera, Environmental Engineering (U)

Anaerobic ammonium oxidation (anammox) is an innovative, efficient, and cost effective method for biological nitrogen removal. The traditional biological removal of nitrogen through nitrification/denitrification, which is used widely in many wastewater treatment facilities, has very high oxygen demand as well as a need for organic carbon in the denitrification process, which are energy-intensive and can produce the greenhouse gas, nitrous oxide. Using anammox, an anaerobic, metabolic process whereby ammonia is oxidized to nitrite then directly reduced to nitrogen gas, there is no need for organic carbon, excess sludge is reduced by 80%, and there is about a 60% reduction in oxygen demand, which translates to far lower energy requirements. While there are many benefits to using anammox bacteria for nitrogen removal, it does not come without its challenges. The main challenges are the slow growth rates of anammox bacteria (doubling time of 10-12 days), the need to maintain optimal conditions for anammox growth, and competition with nitrite oxidizing bacteria and denitrifiers. In this study, different parameters were optimized, including dissolved oxygen, nitrogen loading rate, pH, and temperature. To serve as the anammox enrichment reactor, this study used a four-chamber anaerobic baffled reactor (ABR), which forces flow under and over the baffles containing active anammox biomass. The water quality (pH, electrical conductivity, dissolved oxygen, and temperature) and changes in concentrations of nitrogen species (ammonium, nitrite, and nitrate) were evaluated over a four-month period, and >60% reduction in ammonia was observed after two months of operation. The long-term goal is to use anammox bacteria for the removal of nitrogen from treated wastewater under anaerobic conditions, which are well suited for decentralized operation.

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322 9:00 am EE

Photoirradiation and degradation kinetics of tire wear particle (TWP) leachates

Kelly Hollman, Civil Engineering, concentration in Environmental Engineering (M)

Tire wear particles (TWP) are recognized as microplastics (< 5 mm) released from tire abrasion against road surfaces. TWP may accumulate on roads in dry weather and are transported into surface water via atmospheric deposition and stormwater runoff. Like other microplastics, TWP are persistent in the environment and may serve as vectors of various environmental contaminants. Previous research has shown that tires contain known toxic chemicals, such as 6PPD (antiozonant), plasticizers, and polycyclic aromatic hydrocarbons (PAHs). There is a need to better understand the behavior of TWP in water under realistic environmental conditions including UV exposure. Since TWP transport into marine waters from California coastal areas is likely to be significant, the present study will investigate the leaching of chemicals from TWP in photoirradiated (sunlight) or nonirradiated (dark) artificial seawater. To quantify TWP chemical leachates, dissolved organic carbon (DOC) and total dissolved nitrogen (TDN) concentrations will be measured. Preliminary results have shown varied DOC and TDN concentrations of leachates generated by 10 g/L TWP. DOC concentrations ranged from 5.99 ± 0.18 to 21.36 ± 2.68 mg/L and TDN concentrations ranged from 2.10 ± 0.10 to 6.20 ± 0.61 mg/L, depending on experimental conditions (leaching time and presence or lack of photoirradiation). Leaching and photochemical degradation/transformation rates will also be estimated by measuring fluorescence intensities over time, which is a non-destructive method used in previous water quality studies to monitor organic compounds with fluorescent properties. Overall, this study aims to investigate the leaching of chemicals from TWP and their photodegradation/transformation in artificial seawater. In the future, results will be used to support advising of policy changes in California regarding the regulation of chemicals and materials used in tire manufacturing.

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323 9:00 am FF

Building-level wastewater surveillance for COVID-19: Building a model for predictive epidemiology

Julia Arvizu, Civil Engineering (U)

The surveillance of wastewater from individual buildings with large resident populations has been proposed to monitor for outbreaks of diseases such as COVID-19. We have developed a model for predictive epidemiology based on concentrations of SARS-CoV-2 detected in composite samples of sewage collected from large residential buildings. The model normalizes the signal from reverse transcription quantitative polymerase chain reaction (RT-qPCR) analyses by the nucleic acid extraction volume, the volume of sample processed and analyzed, the per capita sewage flow rate, and the presumed individual shedding rate. We calibrated the model using data from the literature, measured flow rates of potable water, concentrations of SARS-CoV-2 RNA targets measured in sewage samples collected three times per week from two student residence halls at a large urban university in southern California, and information about the number of infected students who were subsequently removed from the building before SARS-CoV-2 RNA was no longer detected in the sewage. Preliminary results indicated that per capita shedding rates may be slightly higher than average values previously reported in the literature.

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324 9:00 am GG

Hydraulic Modeling of Vegetation Restoration and Disturbance in Alvarado Creek

Trevor Eckermann, Environmental Engineering (U)

Wildfires typically contribute to increased rainfall-runoff and sedimentation after the fire, which can be exacerbated in systems with anthropogenic influences. This research focuses on the Del Cerro (DC) reach of Alvarado Creek, a tributary of the San Diego River, which was burned in June 2018. After the first post-fire year, the study site underwent vegetation restoration in November 2020 to reduce the density of non-native plants and burned canopy. Significant regrowth of invasive plants in Spring and Summer of 2021, primarily Arundo donax, was observed. Field data from 2018-2021 consists of topographic elevation and vegetation surveys, soil infiltration, streamflow, and grain size distribution data, which were used to parameterize and calibrate the U.S. Army Corps of Engineers' (USACE) Hydrologic Engineering Center River Assessment System (HEC-RAS) and simulate the impacts of vegetation disturbance on water temperature, depth, velocity, and flood extent. Two vegetation scenarios were modeled: 1) dense regrowth of non-native vegetation and riparian canopy in 2019 and 2) removal of non-native vegetation and canopy following restoration in 2021. Field observations included significant regrowth of invasive plants in Spring and Summer of 2021, increased stream water temperatures, and decreased in-stream grain size distributions. The model was calibrated for five storms and evaluated visually and statistically with the root mean squared error (RMSE) and percent bias (%bias). The final calibrated model performed well, where RMSE for 2019 calibrations reached 0.05 m and %bias was 9.02%. The RMSE for 2021 was 0.05 m and %bias was 8.58%. Our results provide insight into the responses of small urban stream reaches to invasive vegetation and canopy removal. The final calibrated parameters can serve as a baseline for future studies, without field data available, to predict the hydrologic and hydraulic response to disturbance or vegetation restoration efforts. Understanding the relationships of parameters that are connected to the presence or lack of riparian canopy can be useful information for future urbanized stream restoration projects. This research aims to provide a greater understanding of potential impacts restoration efforts may have on the hydraulics of a disturbed urbanized channel following a recent fire, providing a baseline for future simulations.

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325 9:00 am HH

Modeling the effects of fire and vegetation management on flooding and sediment transport in an urban stream system

Danielle Hunt, Civil Engineering - Water Resources (M)

Increasing occurrences of fires in urban settings drive the need for research to identify best practices to manage land and water resources. Urban fires threaten lives, infrastructure, and habitat, while also putting additional strain on limited firefighting resources. In urban riparian environments, opportunistic and invasive plants often dominate vegetation patterns, resulting in an increase in invasive vegetation biomass. The increased vegetation fuel load contributes to an invasive grass-fire feedback cycle, which can alter the geomorphic and hydrologic regimes of urban stream systems through flooding, sedimentation, and water quality processes. The goal of this research is to improve our understanding of flooding and sediment processes within urban areas prone to invasive grass-fire feedback cycles through the use of a hydrologic and hydraulic model. Alvarado Creek, a tributary of the San Diego River in California, provides a unique opportunity to investigate the impacts of disturbances such as non-native vegetation, fire, and management efforts. Following a brush fire fueled primarily by non-native vegetation in 2018, observations showed that a highly invasive species, Arundo donax (Giant Reed) rapidly resprouted. The Arundo donax altered channel stability in the riparian region and encouraged the deposition of sediments in the floodplain until non-native plants were removed through vegetation restoration in 2020. We parameterized FLO-2D, a high resolution two-dimensional hydraulic model, utilizing field data to represent various creek conditions and the complex landscape heterogeneity present within this highly-disturbed urban riparian environment. Shifts in streamflow and sediment dynamics after fire and management will be modeled for the following scenarios: 1) unburned stream reach with native vegetation; 2) non-native vegetation and burned conditions; and 3) burned landscape with vegetation restoration. This work builds upon our current knowledge of wildfire and recovery processes, which can be utilized by local resource managers and engineers to inform and optimize management decisions in urban riverine environments prone to invasive-initiated riparian fires.

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326 9:00 am II

Recovery of Vegetation Biomass after the 2012 Waldo Canyon Fire in Colorado

Emily Andreano, Environmental Engineering (U)

The Waldo Canyon Fire was a forest fire that occurred in the summer of 2012 in Colorado Springs, in the Pike National Forest. The Wildfire burned large amounts of vegetation and watershed area, which are important regulators of water infiltration and storage, stream processes, and hillslope erosion processes. Watersheds that are disturbed are often more prone to debris flows and sedimentation, which can impact downstream water bodies and landscapes. The burn severity of the Waldo Canyon Fire ranged from low to high severity, which influences the recovery of vegetation, hydrologic, and geomorphic processes. We utilized two Landsat 8 products, enhanced vegetation index (EVI) and normalized difference vegetation index (NDVI), at 30 m, every 16 days to investigate the recovery of the forest after the Waldo Canyon Fire from 2012 to 2021. Weaveraged ~24 Landsat 8 images for each year to calculate an average annual EVI and NDVI, which provides estimates of the vegetation biomass present in the study area. This work highlights the slow recovery of vegetation biomass in the northern parts of the watershed, with faster recovery in the southern regions. Preliminary results also indicate an average post-fire vegetation regrowth of 3% per year in the Waldo Canyon. This work has implications for evaluating the lasting effects of wildfires on the environment and landscape recovery.

Session F-6

Poster Physical and Mathematical Sciences 3
Friday, March 4, 2022, 9:00 am
Location: Montezuma Hall

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327 9:00 am JJ

The Impact of Inter-Region Mobility on the Reproduction Numbers of COVID-19 in San Diego County

Abbey Rosario, Statistics (U)

Due to the ongoing COVID-19 pandemic, numerous indices have been implemented to study the spread of COVID-19 in order to develop appropriate control interventions. One of the most widely-used critical indices is the reproduction number, which allows us to predict disease transmission trends. The impact of local mobility across regions has yet to be integrated into the currently-used methods for estimating reproduction numbers. I will present a methodology that we have developed to evaluate the impact of mobility on the effective reproduction number, with a case study on data from six regions of San Diego County. Our analysis shows that local-level mobility can have a significant impact on the reproduction numbers, which can lead to potential changes in the development of control policies.

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328 9:00 am KK

Modeling the effects of nanoparticle-based therapy in controlling SARS-COV-2 infection

Zhibin Chang, Applied Mathematics (U)

In this study, we use mathematical models to evaluate potential nanoparticle-based antiretroviral therapies (ART) to control SARS-COV-2 infection. In particular, we observe how ART can suppress the viral load and reduce the cytokine storm, thereby avoiding severe infection. In addition, we formulate the basic reproduction number and compute how the basic reproduction number is altered by ART. We also use our model to study how initiation timing of ART can affect viral infection control. Our results show that proper implementation of nanoparticle-based therapy can help control the SARS-CoV-2 infection.

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329 9:00 am LL

Modeling Within-Host Dynamics of SARS-CoV-2 Infection: A Case Study in Ferrets

Angelica Bloomquist, Computational Science (D)

Ferrets are commonly used in experimental studies examining respiratory diseases because their lungs are physiologically similar to human lungs. This physiological similarity and the fact they are susceptible to contracting many of the human respiratory viruses makes them an ideal candidate for the modelling of SARS-CoV-2 infection in humans. In this study, we use experimental data and several mathematical models to characterize SARS-CoV-2 within-host infection dynamics. The experimental data consists of viral loads over time for several ferrets infected with viral strains obtained from both the environment and human hosts. These models provide insight into important parameters associated with viral dynamics including infection rate, virus production rate, infectious virus proportion, and virus clearance rate. We are also able to approximate the basic reproduction number which is an essential threshold for establishment of infection. Our estimates are not statistically different between animals infected with viral strains isolated from the environment or human hosts inferring the possibility of fomite transmission. We found several similarities between our results in ferrets and results from human models which further proves that ferrets serve as an applicable animal model. Results generated from these models can be used to expedite further studies on SARS-CoV-2 as new viral strains arise as well as aid in the development of human therapeutics.

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330 9:00 am MM

Modeling Spatio-temporal distribution of HIV particles on cervicovaginal mucus and nanoparticle-based preventive therapy

Anuradha Agarwal, Computational Science (M)

Human Immunodeficiency Virus (HIV) epidemics remain devastating around the world. Since there is no cure for HIV, preventive therapy has received tremendous attention. In order to find the immune cells, the primary target of HIV, the virus needs to cross the cervicovaginal mucus (CVM) layer, which acts as a barrier for the virus to move freely. The drug-filled nanoparticles that destroy viruses in CVM are one of the essential preventive therapies. In this study, we develop mathematical models to describe how the virus transports through the CVM and how this transport is affected by the CVM acidity. We used our model to evaluate the effects of nanoparticle-based therapy on virus distribution and transport across CVM. Our results show that the proper implementation of nanoparticle-based therapy can significantly control virus entry through CVM, thereby avoiding the establishment of HIV infection. Such preventive approaches can be helpful to curb the global HIV epidemic.

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331 9:00 am NN

Modeling and cluster analysis of drug combinations to control HIV infection in the brain

Audrey Oliver, Biology (U)

Despite the development of successful antiretroviral therapies to control HIV (human immunodeficiency virus), there is no cure for HIV due to the presence of viral reservoirs. The brain is one of the least studied reservoirs of HIV, causing a need for life-long continuation of therapy to keep HIV controlled in patients. However, replication of the virus can be controlled to an undetectable viral load in the brain and the plasma when the right combination of HAART (highly active antiretroviral therapy) agents is given. In this study, we develop a mathematical model to study the effects of drug pharmacodynamics of antiretroviral therapy on controlling HIV infection in both the brain and the plasma, which is coupled via the blood-brain barrier (BBB). Using our model, we evaluate the effectiveness of ten commonly practiced drug combinations on controlling HIV in the brain. We further use our model to identify the efficacy of treatment regimens with all possible combinations of one, two, and three drugs selected from a list of 25 FDA-approved drugs. In particular, we categorize the effectiveness based on several indices, such as the viral load after two years of therapy and the time required for the viral load to become undetected. Furthermore, we perform a cluster analysis to determine combinations of therapies, providing similar effectiveness on controlling HIV.

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332 9:00 am OO

Modeling the Temperature-Dependent Microbiome Composition Leading to Black Band Disease of Coral Reef

Alex Busalacchi, Applied Math (M)

Black band disease (BBD) is one of the most prevalent diseases causing significant destruction of coral reefs. Coral reefs acquire this deadly disease from bacteria in the microbiome community, the composition of which is highly affected by the environmental temperature. While previous studies have provided useful insights into various aspects of BBD, the temperature-dependent microbiome composition has not been considered in existing models. We develop a transmission dynamics model, incorporating the effects of temperature on the microbiome composition, and subsequently on BBD in coral reefs. Based on our model, we calculate the basic reproduction number, providing an environmental threshold for the disease to exist in the coral reef community. Our results suggest that temperature has a significant impact on coral reef health, with higher environmental temperatures resulting in more coral infected with BBD in general. Our model and related results are useful in investigating potential strategies to protect reef ecosystems from stressors, including BBD.

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333 9:00 am PP

The Added Benefit of CT-Based Histograms for COPD Diagnoses

Jeremy Tran, Statistics (M)

About 175 million people worldwide suffer from Chronic Obstructive Pulmonary Disease (COPD), a type of progressive lung disease that, despite being mostly preventable and treatable, remains the third leading cause of death globally. COPD diagnosis is primarily based on spirometry, which is inexpensive but inherently limited to measuring lung function as opposed to lung structure. Recently, computed tomography (CT) scans have emerged as a potentially valuable supplement to diagnosis, especially in differentiating the phenotypes of emphysema and small airways disease, yet suitable quantitative metrics are lacking and often restricted only to scalar values. In this HIPAA-compliant and IRB-approved study, with a waived requirement for written informed consent, we sought to examine how using the entire distribution of lung densities could improve the staging of COPD. We retrospectively collected data from 4000 Phase 1 research participants of the Genetic Epidemiology of COPD (COPDGene), comprising inspiratory and expiratory chest CT series, demographic information, and selected medical histories. The lungs in each of the CT series were segmented using a 3D lung segmentation algorithm developed at our institution as part of another study. CT series and resulting lungs masks were then interpolated to isotropic 1mm3 voxels. Lung attenuation histograms were then computed using the interpolated series and masks. Both linear regression and functional regression were utilized in R, with the latter using the refund package. Preliminary results showed that models including the lung densities from inspiratory, expiratory, and attenuation difference mapped (ADM) CT images increased R-squared by 9.35% and reduced mean absolute percentage error (MAPE) by 5.08 compared to the baseline linear regression model, a significant improvement. This research is ongoing and will further explore different FDA methods and their possible use in not only staging but predicting mortality outcome as well.

Session F-7

Poster Health Nutrition and Clinical Sciences 3

Friday, March 4, 2022, 9:00 am

Location: Montezuma Hall

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334 9:00 am QQ

Developmental exposures to non-nutritive sweeteners impact pancreatic development in the zebrafish, Danio rerio

Lily Harrison, Biology (U)

Sucralose and acesulfame potassium (AceK) are non-nutritive artificial sweeteners (NNS) best known for their non-caloric properties. Unlike the natural product sucrose, sucralose is chlorinated and believed to be poorly absorbed and metabolized. AceK is readily absorbed via the gut, poorly metabolized, and readily excreted—yet it is known to cross the placenta and can be detected in amniotic fluid. Due to their popularity in non-caloric foods, exposures to sucralose and AceK are common--including among pregnant women. Sucralose and AceK are 600 and 200 times sweeter than sucrose, measured by their binding and activation of the sweet taste receptors T1R2 and T1R3. These receptors are expressed in the pancreas and play a role in insulin signaling. Here, we sought to investigate the potential hazard NNS exposures pose on development and pancreatic organogenesis in a model vertebrate embryo. Zebrafish (Danio rerio) were exposed to 1 mM glucose, 1 mM sucralose, and 0.1 mM sucralose or AceK beginning at 24 hours post fertilization. Embryonic and pancreatic islet morphology was quantified in Tg(insulin-GFP) embryos at 96 hpf using microscopy. Gene expression of targets related to pancreatic function and metabolism were measured using qPCR. No significant change in islet area was observed in sucralose-exposed embryos, but islet areas were significantly reduced in AceK exposed embryos. Gene expression of insulin was concordant with islet areas, and followed the same exposure trends. Overall, this research suggests that developmental exposures to NNS may disrupt pancreatic organogenesis.

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335 9:00 am RR

The Effects of Prune Extract on Cellular Models of Bone Cancer

Chelsie Miller, Foods and Nutrition (U)

There is strong evidence for prunes as a health food for improvement in digestion due to their high fiber content. More recent work has shown that prunes also have a positive impact on bone health, attributed in part to the antioxidant compounds and polyphenols they possess. Despite their important antioxidant role, the anticancer properties of prunes has yet to be determined. We hypothesize that treatment of osteosarcoma cell lines with prune extracts will lead to a decrease in cell proliferation and migration, driven at least in part due to the antioxidant compounds. We will treat chondrocyte, osteosarcoma, and osteoblast cell lines with varying concentrations of prune extract, and use a CellTiterGlo assay and in vitro scratch assays to measure the effects on cell proliferation and migration, respectively. A key component of our work is establishing the optimum cell culturing conditions and developing robust protocols for important cancer phenotype assays. This includes making the prune extract of which the cells will be treated. Upon completion of these experiments, we hope to better understand the effects of prunes on bone health and disease.

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336 9:00 am SS

Fruits, Gut, and Human Health

AprylHazle Stepp, Foods & Nutrition (U)

Only 20% of Americans consume the USDA recommendation of two cups of fruits per day. This study aims to examine whether fruit (i) alters gut microbiota and fecal metabolome, (ii) impacts motor function and cognition across multiple domains, and (iii) improves vascular and cardiometabolic markers.

Methods:

The study will ultimately recruit 40 healthy men and women (30-70 years old; BMI=20-30 kg/m2), who eat less than two cup equivalents of fruit per day. Using a randomized crossover approach, participants complete two 8-week trials: 1) Fruit consumption: 2 C/d (2C) 2) Fruit restriction: less than 1/2 C/d (.5C) with 8 weeks between trials. Only the most commonly purchased fruit in the U.S. (apples, oranges, bananas, grapes, watermelon, and strawberries) are allowed. Fruit is delivered weekly using a one-week cycle menu for the 2C trial with a composite smoothie provided during the last three days.

During each of four laboratory visits, weight, height, waist circumference, and body composition, balance, flow-mediated dilation, dietary intake and blood pressure are measured. Fasting blood samples, stool, and urine are also collected. Before cognitive and motor function tests, participants eat a 350 kcal muffin. Cognitive function is evaluated using the NIH Toolbox Cognition Battery for processing speed, executive function, working memory, episodic memory, and language. Motor function is assessed with NIH Toolbox Motor Battery tests, the Lafayette pinch gauge, and the Purdue Pegboard.

Results:

Half of subjects have enrolled. Preliminary results for body weight and composition, blood pressure and motor function from 2 (groups) X 2 (timepoints) repeated measures ANOVAs are provided here for those who have completed one project arm. Contrary to our hypothesis, a minor improvement of 0.8 additional pegs assembled were detected after 8 weeks of .5C. However, modest improvements in right hand peg insertion and time to complete the 9-hole pegboard improved after consumption of 2 Cups of fruit per day. No changes in other outcomes were detected.

Conclusions:

Increasing fruit intake did not adversely affect body weight or composition and minor effects on motor function were detected. Given the preliminary nature of the data it is difficult to draw solid conclusions.

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337 9:00 am TT

Pharmacological suppression of the sweet receptor T1R3 impacts larval growth and pancreatic islet development in the zebrafish, Danio rerio

Christine Cho, MS in Environmental Health (M)

Sweet receptors are a class of G-protein coupled receptors that bind ‘sweet’ compounds such as sugars and non-nutritive sweeteners to stimulate intracellular processes such as metabolism and signaling. Vertebrates, including humans, express sweet receptors not only in the taste buds but also in the pancreas, and stimulation of the sweet receptor in the pancreas has been associated with glucose stimulated insulin secretion (GSIS). Glucose bioavailability is associated with expanded islet volume, which is believed to play an adaptive role to hyperglycemia and ultimately diabetes. However, the role of sweet receptors in islet formation and development remains uncharacterized. Because pancreatic islet formation and early embryonic growth may be sensitive to glucose-sensing mechanisms in the pancreas, we herein ask whether the sweet receptor is necessary for the development of insulin producing beta cells in the pancreas of a model vertebrate. Zebrafish (Danio rerio) embryos were exposed to 0.1 mM Lactisole, an inhibitor of the sweet receptor, and varying concentrations (0 mM, 0.1 mM, 1 mM) of glucose along with feed from 4-9 days post fertilization (dpf). This period reflects larval transition from endogenous nutrition (e.g. yolk) to exogenous nutrition, where the larvae may begin to adapt to nutrients available in the environment. Larval growth, as well as islet size, morphology, and count were assessed in Tg(insulin-GFP) embryos at 9 dpf to allow for direct visualization of beta cells. Larval length increased in a concentration-dependent manner with glucose. Embryos exposed to both Lactisole and glucose had decreased length, but increased primary islet area. Secondary islet formation, a normal process that allows for additional beta cell differentiation, was increased by 10% in all Lactisole-exposed larvae. Overall, these results show Lactisole and glucose have an interactive effect. When activation of the sweet receptor was suppressed, growth and overall development were hindered. However, contrary to the hypothesis, Lactisole exposures were not sufficient to suppress neither glucose-induced beta cell expansion in the primary islet nor the formation of secondary islets in larvae. Future work should specifically assess the role of the pancreatic sweet receptor within the regulatory network governing beta cell development and GSIS.

Session F-8

Poster Business Economics and Public Administration / Education 4

Friday, March 4, 2022, 9:00 am

Location: Montezuma Hall

(U) = Undergraduate; (M) = Masters; (D) = Doctoral

338 9:00 am UU

An Analysis of the Food Landscape of San Diego County

Lauren Padden, Marketing (U)

Summary: The objective of our research was to collect the data needed to characterize the food environment of San Diego, focusing on identifying both healthy and unhealthy sources of food. This research involved multiple steps including food mapping San Diego County using Google Earth Pro, coding restaurants and food stores via Google sheets, researching the authenticity of the NEMS-R tool, and then using the NEMS-R tool to analyze restaurants in National City, San Diego.

Objective: To collect the data needed to characterize the food environment of San Diego, focusing on identifying both healthy and unhealthy sources of food

Methods: The method of collecting data regarding the food landscape of San Diego County included a series of steps. The first step was to map out all of the grocery stores in San Diego County using Google Earth Pro and well as farmer's markets, farm stands and small grocers. The next step of our research involved going through a spreadsheet of all the prepackaged food stores in San Diego and verifying whether they are open and whether there is parking available. We then went through a spreadsheet of all the restaurants in San Diego County and verified if they are open, the category of the restaurant, whether they are a national chain, if there is parking on site and if there is a drive-through. The next step of our research was to investigate the authenticity of the NEMS-R tool and to see if it could be used in our research to score the healthfulness of restaurants in National City. The last step of our research involved using the NEMS-R tool to examine the healthfulness of restaurants in National City.

339 9:00 am VV

Digital Innovation Potency in SMEs

Vincent Tran, Information Systems (U)

Digital Innovation is going to be the crux of digital transformation initiatives and a necessity for overall business success. In this study, we focus on the limitations and challenges of advancing digital innovation in small-medium enterprises (SMEs) from the 'employee innovation' perspective. Employee innovation refers to the systematic engagement of employees—whose primary functions are not innovation—in innovation activities such as process innovation and new product development within an organization boundary. Prior research argued that employee participation in innovation is critical to the success of SMEs, for example, due to limited resources and expertise; however, significant barriers stand in the way of actualizing the values of employee innovation, especially in the digital innovation context.

In this study, we first conducted a systematic literature review centered around the key dynamics and determinants of digital intrapreneurship in SMEs. This review helped us to identify common barriers that can inhibit the participation of employees in digital innovation (digital intrapreneurship) in the context of SMEs. We classified these barriers into four groups—structural, technological, procedural, and individual barriers. Structural barriers are related to the organizational setups such as R&D structure and work climate. The technological barriers range from the employees' lack of access to digital infrastructure to the complexity of digital integration. Procedural barriers are associated with engagement mechanisms such as reward systems, management support, and dynamic coordination. At the individual level, we noted both relational and personal challenges such as competence, collaboration, and confidence to name a few.

Lastly, this study introduces and theorizes the notion of digital innovation potency and argues how the identified barriers individually and collectively can affect employee innovation productivity at three levels, Inter-team, intra-team, and individual levels. Accordingly, we propose a digital innovation potency framework that can help SMEs to evaluate their readiness to engage employees in digital innovation at these three different levels. We also offer a set of recommendations on how to monitor and respond to digital innovations barriers in a more systematic way. More generally, this study contributes to digital innovation and digital intrepreneurship literature by laying a foundation for future research and development.

340 9:00 am WW

Student Research for Equity in Representation in Mathematics

Marlene Marin-Alcantar, COE, MA in ED, Dual Language and English Learner Education: Critical Literacy & Social Justice (M)

Currently, Latinx populations are underrepresented in Science, Technology, Engineering and Mathematics (STEM) fields (Taylor, 2020). Part of the problem is that Latinx students are not adequately represented in their math curriculum. Critical mathematics is one way to address this issue directly in the classroom (Mycyck, 2019), thereby engaging students in transformative change and helping them connect with the content they are learning (Gutstein, 2016). These strategies have been studied in the classroom but not in the dual language context. In this study, I developed a critical mathematics lesson that engaged a group of fourth grade students in charting the representation in their math textbook. The 18 participants were bilingual Latinx students in a dual language classroom. The students were then surveyed and interviewed about the process. I used descriptive statistics and content analysis to analyze the results (Creswell , 2012). While most students (12/18) found that their interests were represented in the textbook, the students universally determined (18/18) that whites were over-represented. Many shared that they felt sad, mad, angry, and "it felt racist" to find that whites were overly represented but "none of us" were included. Most students (13/18) believed that it was important for students' interests to be represented because they will be able to understand math better. In accordance with earlier findings by Gutstein (2016) on the impact of critical mathematics, the majority of the bilingual students (15/18) finished the lesson with a determination to change the math textbook to include more cultural groups. Students used math to learn and understand the power relations between groups with the goal to create consciousness about the overt discrimination that is based on race and language, to change their reality; which will eventually lead to students developing individual and social agency outside of the mathematics field (Gutstein, 2016). For future research, I would like to examine the long term impact of a curriculum that integrates critical mathematics.

References

Gutstein, E. "R. (2016). "Our issues, our people—math as our weapon": critical mathematics in a Chicago Neighborhood High School. Journal for Research in Mathematics Education, 47(5), 454–504.

Mycyk, M. E. (2019). Empowering students through mathematics a post-qualitative study (dissertation). ProQuest LLC, Ann Arbor, MI.

Taylor, C. A. (2020). Bridging the culture of mathematics: the impact of lesson studies on teachers' understanding of self efficacy of culturally relevant pedagogy. ProQuest Dissertations Publishing.

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341 9:00 am XX

Examining the perceptions of, first-generation college students from Barrio Logan College Institute

Miriam Garcia, Biology (U)

The purpose of this study is to examine the experiences of first-generation low-income college students who participated in the Barrio Logan College Institute (BLCI) and who have attended or are currently attending a four-year university. Barrio Logan College Institute is a non-profit organization in San Diego dedicated to college preparation for low-income students and their families. BLCI's vision is to help students see college as a possibility by breaking the social and financial barriers that hinder students from applying to college. The study examines the perceptions and barriers that first-generation and low-income college students have about higher education. The findings from this study document the obstacles faced by college-going first-generation students and how the types of support they received at BLCI helped them gain access to higher education. These findings will assist BLCI directors and staff in assessing the effectiveness of their services. Additionally, the findings will help identify the barriers that former students faced during college that was not identified while they were in the program. The methodology will be semi-structured open-ended interviews of twenty BLCI alumni who attended or are currently attending college. The interview protocol is informed by my own experiences as a BLCI graduate as well as the input from current BLCI staff. The interview questions aim to explore the participants' experiences in the BLCI programs and what more the BLCI might have done to make their transition to college more successful.

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342 9:00 am YY

K-5 Teachers' Attitudes toward Queer Children's Literature in the Classroom

Kris Bell, PhD in Education (D)

While all of the approximately 235,000 K-5 students in San Diego County are likely receiving some form of English language arts (ELA) instruction each year, for many, the stories and characters they are exposed to in the classroom do not reflect the diverse gender and sexual identities that exist in their own lives and the lives of their friends and loved ones. When teachers lack the support, knowledge, or resources to feel comfortable and capable of implementing queer-inclusive ELA curricula, research has established that both their students and their entire school climate bear the consequences. This pilot, survey-based study of local K-5 teachers' attitudes toward the use of LGBTQ+ inclusive literature in their classrooms was adapted from a similar study by Page (2017). While initial findings indicate that the survey items were reliable, and the measured constructs were valid, low response rates and a few survey design issues limited the ability to identify other strong correlations in the data. The learnings gleaned from this pilot will be used to inform future studies on this subject, with the ultimate goal of increasing teachers' feelings of efficacy and lowering their feelings of vulnerability around incorporating diverse LGBTQ+ representation in the ELA classroom.

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Abstracts of Presentations

Session G

SAN DIEGO STATE UNIVERSITY

Session G-1

Poster Behavioral and Social Sciences 14
Friday, March 4, 2022, 11:00 am
Location: Montezuma Hall

343 11:00 am A

Officer Involved Homicides: the Influence of Race Composition

Isis Venner, Interdisciplinary Studies: Sociology, Psychology, Africana Studies (U)

In the midst of #BlackLivesMatter protests, and tension between people of color and police departments, scholars have been gathering more complete information on officer-involved homicides (OIHs) and the police departments associated with these deaths. I utilize one such effort, the National Officer-Involved Homicide Database, to determine if race composition of police departments and neighborhoods (the cities where the departments are located) is associated with these OIH. Public expectations purport that race is indeed a significant factor in the outcomes of police-citizen reactions, as many deaths of Black citizens by the police have been widely publicized. Furthermore, data has shown that Black men have the highest rate of being killed by police at 1 in 1,000 while the average rate for all men is 1 in 2,000. Drawing from literature on racial threat and police culture, I expected to see that the greater number of white officers in a department was positively correlated with an increase in Black deaths. I also expected to see that an increase in Black officers would lead to an overall decrease in all deaths. However, the results were quite the opposite. In finding these results, I focused on OIH that were: gunshot deaths, intentional use of force deaths, and general OIHs, both overall and by race-ethnicity. I utilized descriptive statistics to demonstrate patterns across the ten largest documented departments and estimated correlations between the racial makeup of cities and the race of killed citizens, as well as the racial makeup of departments and the race of killed citizens. There was mixed evidence for my hypotheses. An increase in the Hispanic and Black populations in the city was correlated with an increase in overall OIHs of Black and Hispanic citizens and intentional use of force deaths. However, contrary to expectation, an increase in the percentage of Black officers was also associated with an increase in Black citizen deaths, suggesting a complex relationship between race and OIHs.

344 11:00 am B

Using Social Disorganization Theory to Understand Police-Community Interaction in a Multi-Ethnic City: A Quantitative Study on Police Behavior in San Diego

Sheridamae Gudez, Master of Science in Criminal Justice and Criminology (M)

Recent expansions of social disorganization theory focus on minority communities, highlighting that racial segregation is linked to crime. The existing literature fails to expand on the relationship between non-Black communities, policing, and crime. This study adds to this literature by analyzing San Diego, a diverse community, and assessing if similar relationships between different communities, policing, and crime exist. This study asks: 1) Do communities in San Diego City that experience various forms of social disorganization have a greater police presence? 2) Do communities with large minority populations experience more engagement with law enforcement than communities that have larger white populations? In this study I amassed, cleaned, and analyzed 21,138 police reports matched to census tracts within San Diego. I estimated negative binomial regression models predicting police reports to analyze the relationships between community characteristics and police behavior. Results indicate that communities with greater percentages foreign-born populations, divorced, or low homeownership are linked to more police reports. While communities with large Asian or Hispanic populations, high median income, or high homeownership are linked to lower police reports. This study suggests a need for community enriching programs, and a deeper analysis between law enforcement interactions and immigrant communities in multi-ethnic cities.

345 11:00 am C

Emerging Concepts in Neuroethics and Neurosecurity Through Lenses of Identity, Diversity, Autonomy, and Agency

Sophie Koehler, Mechanical Engineering (U)

For the past decade, the emergence of Brain-Computer Interfaces (BCIs) have been utilized in medical practices to improve lives. Examples in modern medicine include the detection of neurotransmitters, electrical stimulation of the substantia nigra to control jerky movements to characteristic Parkinson’s disease, epilepsy, neurological disorders as well as prosthetic limbs. Those suffering from these prevailing disabilities are now able to live a moderately normal life with help from BCIs.

With the rising advancements in BCIs, as shown with companies like Neuralink and Emotiv, we see an increase in the potential for Brain-Computer Interfaces to become mainstream. With this growth, the ever-so important aspect of neuroethics has to be a top priority. The storage of important neural data brings to surface the significance of Privacy, Consent and Agency. Just like with any knowledge stored, a person’s neural thumb print is susceptible to hackers as well as people with harmful intentions. This then gives rise to the importance of creating a secure security platform. With the use of Artificial Intelligence to help monitor and treat diseases, it brings to light the importance of protecting one’s Identity, as well as trying to eliminate biases through the use of augmentation and diversity in machine learning. Through academic research and literature surveying, these concepts become fundamental components when considering designing, programing and implementing Brain-Computer Interfaces into everyday life.

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346 11:00 am D

The Context Diversity of Where People Lived the Longest Predict Implicit Associations between American and Ethnic Identities

Lisandra Dobson, Psychology (M)

Prior research documents that the context diversity of where people currently live predicts implicit biases. We extend this work by examining the extent to which the context diversity of where people lived the longest also predicts implicit biases. This study specifically investigates the extent to which both the context diversity of the county where participants live now and the county where they lived the longest predicts how much Asian Americans are implicitly seen as less American than European Americans (implicit American = White effect). Data from the 2010 U.S Census were used to assess three dimensions of context diversity: minority representation, variety, and integration. A total of 746 counties were included for where people live now and 834 counties were included for where people lived the longest. The sample (N = 230,958) included 45.4% White and 32.5% Asian participants; it was composed of mostly relatively young adults (M = 26.42, SD = 11.20) and included more women (60.8%) than men. Results showed that the implicit American = White effect was less pronounced when people lived now or lived the longest in counties with a higher proportion of Asian Americans (minority representation). Likewise, the implicit American = White effect was less pronounced when people currently lived or lived the longest in counties that were more multiethnic (variety). In line with past research, integration was not a reliable predictor of the implicit American = White effect. The reliable associations were observed whether the analyses were based on the full sample or only on participants for whom the current and longest county of residence were different. These parallel and robust findings for both longest and current counties of residence suggest that the minority representation and variety of the contexts in which individuals have been immersed account for the ease or difficulty with which they associate the American identity with various ethnic groups. These findings are consistent with the notion that implicit biases reflect not only people's immediate and current surroundings, but also their past experiences.

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347 11:00 am E

Pilot Testing a Field Assessment Tool to Assess Inequity in Public Restroom Access and Quality

Sara Rodrigue, Public Health (U)

Access to basic sanitation and our consistent lack of investment in public restrooms disproportionately affects populations experiencing homelessness. To address this issue in San Diego, an interdisciplinary team of faculty and students in the Schools of Public Health and Public Affairs at SDSU have mobilized to launch an action research project on sanitation access. The goals of the overall research project are to promote health equity among populations experiencing homelessness through conducting a field infrastructure assessment in San Diego. The project will examine the state of public restrooms to determine their condition and management and to identify potential barriers to access, especially for populations experiencing homelessness. We are using a restroom assessment survey/tool that can be used to quickly gather data about public restrooms. We complete an observation checklist that is used to score each facility according to their hours, accessibility, cleanliness, maintenance, stock, and potential issues or barriers to access. A pilot testing team of 2-3 people choose a location to start using a map of the public restrooms in San Diego. Once we have chosen a cluster of restrooms, we assess the facilities within that area using our assessment tool. Current efforts are centered around refining the tool and how each of these domains are measured and scored. We have evaluated 9 restrooms and found that they are not stocked well with toilet paper, soap, paper towels, and seat covers. They lack proper maintenance, for example, broken door locks, sinks, and toilets remain unrepaired. The hours posted do not reflect the hours the restrooms are open. The most well maintained restrooms are in areas designed for tourists, such as Old Town. We have modified this tool by adding questions to obtain the exact location, date, time of access, and continue to modify the tool after each outing assessing restrooms. Ongoing pilot testing will help us modify the tool further, begin addressing public restrooms' proximity to businesses, and the different entities that maintain them. Findings will be used to support advocacy efforts of community organizations working for sanitation justice, and to inform local policy decisions for restroom access.

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348 11:00 am F

End Poverty Dashboard: A look into Homelessness and the SDGs in San Diego County, California

Nasser Mohieddin, Big Data Analytics (M)

The 17 United Nations Sustainable Development Goals (SDG) provides an outline to reach global peace and prosperity with each individual goal and its multiple indicators. SDG 1, for instance, aims to "end poverty in all its forms everywhere," as measured by indicators such as reducing populations in poverty to at least half the proportion and creating accessible resources for countries to end poverty through policies and programs. Homelessness is one of the major indicators of extreme poverty and has been a prevalent and growing issue in the United States, and more specifically in California. According to the Homeless Regional Task Force in San Diego County, 4,152 individuals experienced homelessness in 2020 compared to 2,326 individuals in 2019. SDG 1 targets this vulnerable population and ensures fair and equal access to basic human rights like food and shelter.

In this study, we aim to collect and perform quantitative analysis of data of San Diego County's homeless population as an indicator of poverty as defined by the UN 1: Poverty.

We will create an interactive dashboard using ArcGIS Pro and hotspot map that represent findings and trends to identify key vulnerable areas within San Diego County based on SDG 1 indicators, and provide policy recommendations concerning lack of data, policies, resources, and progress. The dashboard aims to provide a valuable insight into poverty, inequality, and other socio-economic issues that contribute to homelessness. The goal is to identify and recommend future steps aimed at combating homelessness and its roots. Eradicating poverty and homelessness should be a priority as it not only improves the quality of life for those experiencing it, but everyone else as well.

There have been many attempts in California aimed at ending homelessness. However, in most cases those programs are focused on ending the visible problem rather than addressing the root cause. Although programs have been implemented at a local level, many fail to address the root cause of this issue. Our analysis aims to consider SDG variables that contribute to homelessness to provide a more well-rounded insight, as well as promote the UN's efforts.

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349 11:00 am G

Involving caregivers in telepractice assessment: Creating a culturally appropriate orientation

Elise Ramirez, Speech, Language, and Hearing Sciences (U)

Telepractice, remote service delivery, can make speech and language services more accessible to families in need of a bilingual language assessment. Because clinicians will not be in the same physical location, caregivers may play a crucial role in assisting with task administration.

The purpose of this study was to develop an effective and culturally appropriate orientation for caregivers to assist in administering language tasks during a telepractice language assessment.

The orientation includes instructions on how to administer language sample tasks and tips on how to prompt the child for responses. We followed procedures based on the Cultural Adaptation Process Model (CAP; Domenech Rodriguez & Weiling, 2004) to ensure that the protocol was culturally appropriate. Procedures we included from the CAP model were collaborating with experts, completing a literature review, adapting, piloting, reviewing, and finalizing the protocol. For this presentation, we will focus on data from the pilot.

Piloting included two separate telepractice sessions for comparison. In the first session the caregiver is given the orientation and asked to administer a story retell task to their child while the clinician observes. In the second session the clinician administers the task to the child while the caregiver observes. The sessions were separated by 5 days and two different stories were used for the story retell task. In the task, the child listens to a prerecorded version of a story accompanied by story visuals and is asked to retell the story in their own words.

The sessions were recorded via Zoom recording and analyzed for behavioral codes. Behavior codes were based on Du and colleagues (2020) and measured behaviors of both interference (e.g., responding for the child) and support (e.g., encouraging the child to continue). We analyzed and compared the behaviors of the task administrators, i.e., the caregiver in the first session and the clinician in the second session. We compared the frequencies of each type of behaviors and made observations on the differences.

Analyses are ongoing and will contribute to the final revision of our protocol. Changes to the protocol may include ways to appropriately decrease interference behaviors and increase support behaviors.

Session G-2

Poster Behavioral and Social Sciences 15
Friday, March 4, 2022, 11:00 am
Location: Montezuma Hall

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350 11:00 am H

Racial/Ethnic and Gender Differences of Cigarette Smoking Rates: California Compared to Tobacco Growing States

Amber Davis, Public Health (U)

Cigarette smoking remains the leading preventable cause of death in the United States. State-level smoking rates are influenced by their tobacco control efforts. California has the longest-running comprehensive tobacco control program in the nation, while the tobacco growing states (TGS; Georgia, Kentucky, North Carolina, South Carolina, Tennessee, Virginia) generally have less restrictive tobacco control measures (e.g., low excise taxes, limited media campaigns and prevention programming). We analyzed the nationally representative 1992-93 to 2018-19 Tobacco Use Supplements to the Current Population Surveys to examine time trends in the self-reported current smoking prevalence rates for non-Hispanic Blacks (NHB) by gender in California and the TGS. In California, the smoking rate for NHB males was 30.1% in 1992-93 and 8.7% by 2018-19; compared to 33.4% and 15.9% in the TGS, respectively. The rates for NHB females in California were 22.9% in 1992-93 and 11.8% by 2018-19; compared to 22.1% and 10.2% in the TGS, respectively. There were significant decreases in smoking rates over time in both California and the TGS for NHBs. Current cigarette smoking rates for NHB males remained higher in the TGS compared to California. Although NHB female smoking rates also declined over time, the California rate in 2018-19 appeared higher than the TGS. Substantial work remains to be done in reducing smoking rates among NHBs overall; efforts to reduce smoking among NHB males in the TGS would be beneficial, while California should take action to address the higher smoking rates among NHB females compared to the TGS.

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351 11:00 am I

Internalized stigmas and substance use among sexual minority men

Eduardo Hernandez Mozo, Biology and Psychology (U)

Sexual minority men (SMM) are at elevated risk of developing substance use disorders compared to their heterosexual counterparts, especially SMM of color. Based on multiple jeopardy theory and minority stress theory, SMM of color experience oppression due to both their racial or ethnic identity and their sexual orientation. Due to White, heteronormative cultural standards, SMM of color often internalize negative beliefs about their sexual orientation and racial identity, both of which are associated with substance use. As part of a larger study, we collected data from 167 SMM of color participants via an online survey across the U.S. Participants were asked questions about demographics, internalized homophobia, internalized racism, alcohol-use, cigarette-use, and ethnic identity acceptance. We will run four moderation analyses examining the relation between internalized homophobia and substance use (alcohol and cigarette-use) to determine the potential moderating effects of internalized racism and ethnic identity acceptance. We hypothesize that internalized racism will significantly moderate the links between internalized homophobia and substance use, such that higher levels of internalized racism will catalyze the positive links between these two constructs. We expect ethnic identity acceptance to dampen this relation. Insights gleaned from this research will help to support the development of substance use prevention programs and interventions among SMM of color.

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352 11:00 am J

The Role of Social Determinants of Health in Veteran Suicide: A Systematic Literature Review

Ray Cameron Vialu, Master of Public Health- Health Promotion and Behavioral Sciences (M)

Introduction: Suicide remains a prevalent issue in the veteran community. Historically, suicide prevention research has primarily focused on individual-level risk factors, such as mental health; however, there have recently been calls to take a broader, public health approach when examining suicidality. In particular, emerging research suggests the importance of considering the contexts in which veterans live through the study of social determinants of health (SDoH). Given the shifting perspective, there is a need to synthesize the current state of the literature; the objective of this PROSPERO-registered systematic review was to address this need by examining the available literature regarding the link between SDoH and suicidality among veterans.

Methods: Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) guidelines were followed. A keyword search of three online databases (PsychINFO, PubMed, and CINAHL) was conducted. Articles published between January 2000-May 2021 that examined at least one SDoH (e.g., housing or food insecurity, trauma) as a risk factor or correlate for suicidality among U.S. veterans without other serious medical conditions were eligible for full-text review; data extraction and quality review was completed by two independent reviewers.

Results: Following the keyword search, 1,515 articles underwent title and abstract screening. Of those, 79 (5.2%) were deemed eligible for full-text review and extraction. While the full text review is ongoing, preliminary results indicate that the SDoH most commonly examined as risk factors for suicidality were: economic stability (n=30, 38.0%), social support/social context (n=27, 34.2%), and education (n=24, 30.4%). Most articles examined just one (45.3%) or two (21.3%) SDoH. The studies were primarily cross-sectional (n=59; 74.4%), used surveys (n=53, 67.1), and exclusively examined suicidal ideation (n=52, 65.8%).

Conclusion: This review shows the current state of the science in the study of contextual factors related to veteran suicide. Although many articles examined SDoH, few included more than one factor, indicating a need for more comprehensive approaches to the study of suicidality in veterans. The results of this study can inform future research and can be applied in the development of veteran risk screenings and suicide prevention efforts.

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353 11:00 am K

Generational effects of stigma, trauma, and mental illness within the youth in East African Communities

Nyakoach Lam, Social Work (M)

Background: Multiple generations within East African communities have experienced displacement from their home country due to civil wars, political conflict, violence, or fear of being persecuted. This forced relocation and efforts to acculturate to the host country presents a myriad of psychological, behavioral, and biological outcomes. Research has shown how historical trauma directly influences the health of individuals and whole communities. While the youth growing up in a new host country may not have experienced the effects of displacement directly, there has been an indirect impact on their mental health. These outcomes go unnoticed due to cultural customs and norms that do not acknowledge mental illnesses. Within the Southern Sudanese community, mental health is a taboo subject that is seldom addressed even in severe cases.

The purpose of this research is to examine the extent that trauma is passed down through generations, particularly the youth in the South Sudanese community.

Methods: We conducted 20 in-depth qualitative interviews with participants from the Southern Sudanese community in San Diego as part of an HLINK NIMHD- funded pilot study to examine how stigma has prevented this population from receiving proper medical attention pertaining to mental health. Participants between the ages of 18-30 were picked at random and interviewed anonymously based on their experience as a refugee. Grounded theory methodology was used for the analysis.

Results: Despite the resilience within the community to assimilate to their host country and provide a decent living for themselves, the following themes emerged; South Sudanese refugee youth a) struggle with identifying any mental illnesses, b) have resentment towards family and/or culture for their upbringing that manifest in disabling mental health symptoms and c) undergo an identity crisis that impacts their behavioral outcomes.

Conclusions: Generational effects of stigma, trauma, and mental illness within the South Sudanese community have gone unprecedented and understudied. This research study uncovers the intersection of trauma and cultural experiences among the youth in the community.

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354 11:00 am L

Qualitative analysis of the impact of socioeconomic factors on eating disorder risk among transgender and gender diverse young adults

Catalina Torres, Public Health (U)

Transgender and gender diverse (TGD) individuals experience elevated risk for eating disorders (ED). While transgender stigma and gender dysphoria can heighten these risks, less is known about how socioeconomic status (SES) contributes to ED risk in TGD populations. Thus, we sought to understand how SES is related to ED among TGD young adults (ages 18-30) using qualitative analysis of 8 asynchronous online focus groups. Each group was asked a series of questions twice daily over 4 days. Of the 66 participants, 41% self-identified as transgender men, 28% non-binary, 25% transgender women, 6% another gender; 62% self-identified as White, 13% multiracial, 6% Asian, and 6% Black; 49.3% attended college but did not graduate, 38% graduated college, 12.7% did not finish high school, and 12.7% experiences unstable housing in the past 6 months. We analyzed focus group data using the rapid and rigorous qualitative data analysis (RADaR) technique for thematic analysis. Preliminary findings suggest that socioeconomic factors (e.g., insurance, education, income) are interwoven with ED experiences in various ways. For example, as one participant described, income and insurance inequities make it difficult to find providers who are competent in both gender affirming health care and ED: “Getting insurance to understand that there is no one provider in their network who meets my needs has been a nightmare.” Participants also mentioned the effect of income on gender identity and how that can directly implicate ED risk: “My body shape contributes to both my dysphoria and my ED, I don’t have much money to pay for transition related needs that would alleviate bodily distress. In addition, the access to education and employment seem to provide support. One participant illustrated how privilege of these two can introduce sources of strength when experiencing EDs: “My main sources of strength or support is my work and school. Making my boss and professors proud of me helps me be proud of myself and recognize what they recognize in me.” These data illustrate that understanding the connection between SES and ED among transgender individuals can inform prevention and treatment efforts for this population.

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355 11:00 am M

A Comparative Evaluation of Behavioral Questionnaire Use in the FASD-Tree

Chloe Sobolewski, Psychology (U)

The FASD-Tree is a novel screening tool for fetal alcohol spectrum disorders (FASD), calculating dichotomous decision tree (FASD+/FASD-) and continuous risk score (0-5) outcomes. This study aimed to determine if the Behavioral Assessment for Children, 3rd Edition (BASC-3) could be substituted for the Vineland Adaptive Behavior Scales, 3rd Edition (VABS-3) and Child Behavior Checklist (CBCL) in the FASD-Tree to reduce subject burden.

Data were collected from children with histories of prenatal alcohol exposure (AE) and controls (CON), as part of the Collaborative Initiative on Fetal Alcohol Spectrum Disorders, Phase Four (CIFASD-4). Data were obtained from physical exams and parent questionnaires (CBCL, VABS-3, BASC-3). FASD-Tree outcomes were calculated using original (CBCL, VABS-3) and modified (BASC-3) measures. Correlations and validity/reliability measures were calculated.

Of the 238 subjects, 125 were male (52.5%), 160 were White (67.2%), and 56 were Hispanic/Latino (23.5%). The average age was 10.9y (SD = 3.47). Moderate to strong correlations were indicated between the original and modified decision tree outcomes ($r = .58$, $p < .001$) and between the original and modified risk scores ($r = .74$, $p < .001$). Validity and reliability measures were as follows: original decision tree: 79.5% overall accuracy, 80.4% sensitivity, 76.8% specificity, 91.2% positive predictive value (PPV), and 56.6% negative predictive value (NPV); original risk score: 86.6% overall accuracy, 89.9% sensitivity, 76.8% specificity, 92.1% PPV, and 71.7% NPV; modified decision tree: 75.0% overall accuracy, 72.5% sensitivity, 82.5% specificity, 92.5% PPV, and 50.0% NPV; modified risk score: 84.2% overall accuracy, 87.8% sensitivity, 55.0% specificity, 94.1% PPV, and 35.5% NPV.

Overall accuracy rates and validity measures were similar across versions, providing preliminary evidence that using BASC-3 may be a valid alternative to the VABS-3 and CBCL that decreases subject burden. Lower NPV and specificity in the modified FASD-Tree suggest that it may be better suited to a high risk population. Research supported by grants U01AA014834, T32AA013525, R25GM058906.

Session G-3

Poster Biological and Agricultural Sciences 9
Friday, March 4, 2022, 11:00 am
Location: Montezuma Hall

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356 11:00 am N

Study and Characterization of Metamorphosis Inducing Factor 1 (Mif1) in Pseudoalteromonas luteoviolacea

Carl Westin, Microbiology (M)

The marine bacterium Pseudoalteromonas luteoviolacea has been found to induce metamorphosis in a species of marine worm known as Hydroides elegans, however the mechanism is currently unknown. Previous studies have shown that a protein called Metamorphosis inducing factor 1 (Mif1) is heavily involved in this process. The protein is loaded into harpoon-like structures produced by the bacteria, and injected in larval worms, which in turn causes the larval worms to undergo metamorphosis. Previous bioinformatic analyses suggest that Mif1 stimulates metamorphosis by functioning as a lipase. Ongoing research is being done to determine the active region/regions of Mif1.

The method of analysis involved splitting the protein into a number overlapping fragments, purifying those fragments, and testing them for activity using various enzymatic assays. Fragment A1, which is a stretch of around 170 amino acids in the N-terminus region of Mif1, was found to have the most lipase activity. Further bioinformatic analysis of Fragment A1 showed the presence of a residue that is highly conserved across various phospholipases. This residue contains a histidine, an aspartic acid, and a lysine. In order to test if this residue is responsible for the lipase activity of the protein, 3 point mutants are being made to test for the loss of lipase activity. These 3 amino acids were all separately changed to an alanine using MacVector, yielding 3 separate point mutants.

The remaining steps of this experiment involve cloning, protein purification, enzymatic assays, and metamorphosis assays for all 3 point mutants. After successful PCR reactions and subsequent Gibson assemblies, the proteins need to be expressed and purified. Expression and purification can be challenging as the lipase activity of Mif1 has shown to be toxic to E. coli, meaning protein yields are generally quite low. Once the protein is successfully produced, both an enzymatic lipase assay and a metamorphosis assay are necessary to complete this experiment. The lipase assay should show a loss of lipase activity coupled with loss of metamorphosis in Hydroides elegans using a metamorphosis assay. Which will ultimately show us the region responsible for stimulation of metamorphosis in Hydroides elegans.

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357 11:00 am O

Assessing Acute Toxicity and Reproductive Success of Marine Invertebrates such as Artemia Salina when exposed to TCPM and TCPMOH

Tatiana Bok, Environmental Science (U)

Tris(4-chlorophenyl)methane (TCPM) and tris(4-chlorophenyl) methanol (TCPMOH) are environmental contaminants that have been detected in environmental samples, particularly from samples collected from the ocean. They are emerging contaminants of concern and are possible endocrine disruptors. The origin of TCPM and TCPMOH has not been established, but there is scientific evidence that the chemicals are potential byproducts of dichlorodiphenyltrichloroethane (DDT), a well-known anthropogenic pesticide. There is strong evidence that both TCPM and TCPMOH have the potential to bioaccumulate and become biomagnified in wildlife. Due to their structural similarities to DDT, TCPM and TCPMOH have the potential to emulate similar toxic health effects to human health and the environment as DDT. Despite scientific evidence of these chemicals potentially posing similar toxic health effects, there are currently not enough toxicity assessments conducted to confirm suspected health effects. In this study, we investigate the aquatic toxicity of TCPM and TCPMOH using brine shrimp (Artemia salina) as our biological model. Brine shrimp (Artemia) cysts and nauplii were exposed to various levels of TCPM and TCPMOH for 24 hours. After this 24-hour period, we assessed hatching success, acute survival rate, and morphology. Implications of this research include providing more toxicity data on TCPM and TCPMOH that can be used for policymakers and regulatory agencies.

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358 11:00 am P

The marine contaminant Tris(4-Chlorophenyl) Methane (TCPM) impairs embryonic development and disrupts gene expression in zebrafish embryos

Jessica Yost, Master of Science in Public Health with an emphasis in Environmental Health Sciences (M)

Tris(4-chlorophenyl)methane (TCPM) is a marine contaminant of emerging concern, believed to be a technical by-product of the persistent pesticide dichlorodiphenyltrichloroethane (DDT). TCPM has been detected in samples from marine species around the world, as well as in human matrices such as serum and breast milk. Lack of mechanistic research, monitoring, and regulation of TCPM raises concerns about the safety of public health, wildlife, and the environment. In this study, wild-type AB zebrafish embryos were exposed to 0.1, 1, or 10 μM of TCPM for five days and analyzed for growth and morphology. Increased rates of mortality and deformities were significantly higher among those exposed to TCPM than controls. Increased incidence of yolk sac edema, pericardial edema, failure of swim bladders to inflate, and stunted growth were observed in 1 and 10 μM exposure groups. Ethoxyresorufin-O-deethylase (EROD) activity, an indicator of Cyp1a activity, was also quantified in embryos using co-exposure to 7-ethoxyresorufin. Embryos exposed to 10μM of TCPM had 57% higher EROD activity than controls. Embryos were also acutely exposed to TCPM from 96-100 hours post fertilization to characterize the acute molecular response to TCPM using RNA sequencing. Pathways governing energy metabolism and ATP generation were significantly increased. In conclusion, this work demonstrates that TCPM, a known marine contaminant, can impair embryonic growth and survival. More studies are necessary to determine the chronic impacts of TCPM environmental exposures, and more biomonitoring studies are needed to contextualize the public health consequences of these exposures.

359 11:00 am Q

Tris(4-chlorophenyl)methane (TCPM) and Tris(4-chlorophenyl)methanol (TCPMOH) disrupt pancreatic organogenesis and gene expression in zebrafish embryos

Peyton Wilson, Environmental Health (M)

Tris(4-chlorophenyl) methane (TCPM) and Tris(4-chlorophenyl) methanol (TCPMOH) are anthropogenic environmental contaminants believed to be manufacturing byproducts of the organochlorine pesticide Dichlorodiphenyltrichloroethane (DDT) due to environmental co-ocurrence. TCPM and TCPMOH are persistent in the environment, bioaccumulate in marine species, and are detected in human breast milk and adipose tissues. Due to the known toxicity and endocrine disrupting potential of similar organochlorines, we aimed to determine impacts on zebrafish pancreatic growth and gene expression following developmental exposures. Zebrafish embryos were exposed to 50nM TCPM or TCPMOH beginning at 24 hours post fertilization (hpf) and exposures were refreshed daily. At 96 hpf, pancreatic growth and islet area were directly visualized in Tg(ptf1a::GFP) and Tg(ptf1a::GFP) embryos, respectively, using microscopy. Gene expression was assessed at 100 hpf with RNA sequencing. Mean Islet area and exocrine pancreas area were reduced by 26% and 16.3%, respectively, in embryos exposed to 50nM TCPMOH compared to controls. Transcriptomic responses to TCPM and TCPMOH were correlated (R2=0.84), and pathway analysis found downregulation of processes including retinol metabolism, circadian rhythm, and steroid biosynthesis. In conclusion, TCPMOH, but not TCPM, impairs pancreatic development despite similarity in molecular responses.

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360 11:00 am R

A Characterization of the Microbes and Viruses Present in the Tijuana River and Estuary to Elucidate Potential Pathogens

Nicholas Allsing, Master of Science Biology (Molecular Biology) (M)

The degradation of the water quality in the Tijuana River Watershed poses a serious health risk to the communities of San Diego and Tijuana. The older sewage infrastructure has not been able to keep up with the growth of the surrounding cities, causing an overflow from treatment plants, especially during times of heavy rain. The increasing level of contamination in the Tijuana River detrimentally affects the surrounding socioeconomically disadvantaged cities of San Ysidro and Imperial Beach, and may be a cause of the increased incidence of chronic disease in the area. We performed untargeted metagenomic sequencing in order to better understand the potential role that sewage contamination in the Tijuana River plays on the health of those living in its proximity. Water samples were collected from six different sites along the river. After filtration, the DNA was extracted and sequenced for metagenomic analysis. The sequences were quality controlled and run through a taxonomic classification program. Using this data, we were able to perform diversity analysis between the sites, identify specific markers of fecal contamination, and construct a pathogen profile of the most abundant disease causing microbes and viruses present in each of the samples. This and future metagenomic analyses of contaminated water samples will help bring awareness and a more targeted solution to this growing problem.

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361 11:00 am S

Environmental fate and transport of cigarette butt leachate chemicals in a marine environment

Christine Stewart, Environmental Health Sciences (M)

Smoked cigarette butts (CBs) are a pervasive pollutant in water bodies. They are the most commonly found personal litter item on beaches worldwide, as more than 4 trillion CBs are discarded into the environment per year. When CBs are dumped into water bodies, chemicals from the cigarette filters seep into the surrounding water, forming CB leachate. CB leachate is known to be toxic to marine life and includes chemicals such as PAHs, nicotine, arsenic, and heavy metals. Despite the established danger of CBs, little research has been done to show the extent of the harm they cause the environment, especially in the long term. This study assesses the bioaccumulation potential and partitioning of CB leachate chemicals between Macoma nasuta, water, and sediment samples. To accomplish this, a non-targeted analysis was performed on sediment, water, and clam tissue after a 28-day bioaccumulation bioassay using GCxGC/TOFMS. Highly identifiable chemicals from each sample will be prioritized based on partitioning between samples, as well as persistence, bioaccumulation, and toxicity data gathered from the EPA's CompTox Dashboard. Prioritized chemicals will then be quantified in each sample. The preliminary non-targeted analysis shows 121 chemicals unique between the three sample media, with 4 of those chemicals identified across multiple sampling media.

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362 11:00 am T

Developing New CRISPRi toolkit for Marine Bacteria

Alpher Aspiras, Cell and Molecular Biology (U)

We are now designing a new set of genetic toolkits to research host-microbe interactions and their underlying processes since studying them in the marine environment is difficult. To expand the scientific knowledge and diversify the tools available for genetic manipulation of marine bacteria, we set out to expand and develop a new genetic toolkit to broaden that accessibility. The genomic components of our plasmid toolkit allow for its broader use in a variety of different marine bacteria. To develop and test our new tools, we used the marine bacterium Pseudoalteromonas luteoviolecea that has been shown to produce a contractile injection system, called Metamorphosis-Associated Contractile Structures (MACs), to induce metamorphosis of the tubeworm Hydroides elegans.

We hypothesize that by using CRISPRi techniques to target metamorphosis-inducing genes in P. luteoviolecea, we will be able to regulate the bacterium's gene functionality. In Phase 1, we used CRISPRi Golden Gate Assembly (GGA), to assemble different DNA fragments into a plasmid that targets the macB gene specifically for gene knockdown. In Phase 2, using the assembled Golden Gate Assembly plasmid, we then conjugated the pBTK plasmid toolkit into P. luteoviolecea. For Phase 3, we performed a phenotypic assay using metamorphosis as the biological readout. Finally, in Phase 4, we will be writing the manuscript based on what was discovered, to later submit it to the American Society for Microbiology for publication. This project provides a proof-of-concept that we can develop additional genetic toolkits to manipulate the phenotypes of marine microbes such as; gene expression, fluorescence, pigmentation, and metamorphosis. Future gene manipulation for biotechnology can be carried out since different genes reflect diverse features and functions of the organism.

Session G-4

Poster Biological and Agricultural Sciences 10
Friday, March 4, 2022, 11:00 am
Location: Montezuma Hall

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363 11:00 am U

Investigation of the DNA Damage Host Response during Parasitic Infection with the Sexually Transmitted Parasite Trichomonas vaginalis

Remicia Germeille, Biology (U)

Trichomonas vaginalis is an extracellular parasite that causes the non-viral sexually transmitted infection (STI) known as trichomoniasis. Patients infected with T. vaginalis have an increased risk of aggressive prostate cancer and cervical cancer. The molecular mechanisms that contribute to this association are currently unknown. T. vaginalis infection causes cellular damage to epithelial cells of the female reproductive tract and induces inflammation, the latter is a critical hallmark contributing to carcinogenesis. We hypothesize that T. vaginalis infection of ectocervical cells leads to the activation of DNA damage response in host cells. In order to test for activation of the DNA damage signaling pathway during T. vaginalis infection, we co-cultured T. vaginalis with an ectocervical cell line (Ect-1) at various multiplicities of infection and collected whole cell lysates. We then performed western blot analysis and probed for specific proteins involved in the DNA damage response pathway. We found that upon exposure of ectocervical cells to T. vaginalis, there was increased detection of phosphorylated-γH2AX. γH2AX is a histone protein downstream of the kinase ATM which is activated when DNA damage occurs in a cell. Detection of phosphorylated-γH2AX upon co-culturing T. vaginalis with Ect-1 cells may indicate host cell signalling to repair DNA single or double stranded breaks. We are in the process of testing for the presence of additional proteins that signal the generation of DNA double strand breaks. We will also determine if the DNA damage response is activated with different strains of T. vaginalis. An update on this progress will be presented. Our findings will generate novel knowledge about the type of cellular damage inflicted by T. vaginalis on ectocervical cells, generating insight about how T. vaginalis infection drives increased risk of cervical cancer.

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364 11:00 am V

The kinetic mechanisms of isocitrate dehydrogenase 1 (IDH1) mutants

Rachel Khoury, Chemistry, B.S. in Applied Arts and Sciences and Certificate of the American Chemical Society (U)

The metabolic enzyme isocitrate dehydrogenase 1 (IDH1) catalyzes the NADP+-dependent conversion of isocitrate to α-ketoglutarate (αKG). Mutations in IDH1, which primarily affect the R132 residue, can cause a neomorphic reaction where αKG is converted to D-2-hydroxyglutarate (D2HG). The catalytic efficiencies of D2HG production can vary greatly between IDH1 mutants. The arginine to histidine mutation at site 132, R132H, is one of the most common mutations identified in patients with lower grade gliomas and secondary glioblastomas and weakly drives D2HG formation. We have shown previously that smaller residues at residue R132, like R132G, drive more efficient D2HG formation. Here, we propose to study the kinetic features of an arginine to alanine mutation, R132A, an experimental mutation that is yet to be explored. Through steady-state kinetic analysis of the R132A mutation, we can gain a better understanding of what chemical and structural features can facilitate the neomorphic reaction.

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365 11:00 am W

Investigating the role of motility in Trichomonas vaginalis pathogenesis

Bryn Baxter, Microbiology (U)

Trichomonas vaginalis is a protozoan parasite responsible for the most common nonviral sexually transmitted infection, trichomoniasis. Although this infection affects nearly 200 million people each year, little is known about the molecular mechanism utilized by the parasite to cause disease. We hypothesize that T. vaginalis motility driven by the parasite's five flagella plays a key role in mediating infection. In order to investigate this, we will perform the first characterization of kinesin-II proteins in T. vaginalis. Kinesin-II proteins are motor proteins that mediate anterograde intraflagellar transport that is necessary for flagellar assembly and function of this organelle. To identify candidate flagellar-localized kinesin-II proteins, we searched the T. vaginalis genome (TrichDB) for genes annotated as putative kinesin-II proteins. Afterwards, we performed bioinformatic analysis of these proteins, using programs including NCBI Blastp, Uniprot, and Clustal Omega in order to test for homology with other flagellar kinesin-II proteins and perform multiple sequence alignments. We identified three kinesin-II genes with similarity to putative kinesins found in the flagella of other single cell eukaryotic protozoan parasites. Additionally, Interpro and Clustal Omega analysis revealed that all three T. vaginalis putative kinesin-II proteins contain a highly conserved kinesin motor domain. Interestingly, this predicted protein feature has homology to the domains of other putative kinesin-II proteins in protozoan parasites such as Toxoplasma gondii. We also tested for the predicted protein structure and folding using Phyre2 and found that all three genes have predicted tertiary protein structures similar to kinesin-II proteins. We are in the process of cloning these candidate genes to express them with two C-terminal HA tags in T. vaginalis to test if they indeed localize at the T. vaginalis flagella. If so, we plan to knock them out in order to generate the first T. vaginalis motility mutants. An update on this research will be presented. These findings will generate novel knowledge about the cellular biology of T. vaginalis flagella and the role of motility in T. vaginalis pathogenesis.

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366 11:00 am X

Clust-Tree: an automatic partitioning of phylogenetic tree and identification of unique MSA features

Adrian Ortiz Velez, Biological and Medical Informatics (M)

Phylogenetic analysis of protein sequences provides a powerful means of identifying novel protein functions and subfamilies, as well as identifying and resolving annotation errors. However, automation of functional clustering based on phylogenetic trees has been challenging, and most of it is done manually. Clustering phylogenetic trees usually require inter and intra-specific thresholds, leading to an ad hoc problem. We propose a new likelihood distance phylogenetic clustering algorithm that identifies clusters without using any ad hoc distance or confidence requirement. The algorithm combines uniform manifold approximation and projection (UMAP), as a dimension reduction technique, with Gaussian mixture models as a k-means like procedure to automatically group sequences into sub-families. Our algorithm also applies a “second pass” hierarchical cluster identification algorithm to resolve non-monophyletic groups. After identifying the clusters, we also perform a site analysis using probabilistic and phylogenetic techniques to identify aspects of the alignment that may functionally differentiate distinct protein families. We tested our approach with several well-curated protein families (Outer membrane proteins, acyltransferase, and dehydrogenase) and showed our automated methods recapitulated known subfamilies. We also applied our methods to a broad range of different protein families, multiple evolving at highly different rates from multiple databases, including Pfam, PANTHER, and UNIPROT. Our results showed that our approach readily resolved a wide variety of putative subfamilies across a wide range of evolutionary rates both within and among phylogenies. Our automated UMAP-assisted Gaussian-Mixture clustering and random forest feature importance will enable novel functional annotations on increasingly large biological datasets.

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367 11:00 am Y

An R Package for Estimation of Pairwise Genetic Relatedness

khuyen nguyen, Bioinformatics (M)

Humans are genetically related to each other one way or another but the degree of relatedness varies due the presence of genetic population structure. A lot of relatedness estimators out in the field are constructed based on the assumption that populations are homogenous and population structure is not taken into account. A recent study by Sethuraman (2019) developed a new method called “Inrelate” that estimates genetic relatedness between individuals while controlling for the presence of population structure and inbreeding. In order to estimate relatedness in admixed populations, InRelate takes into account the multi-allelic genomic data, nine different Identity By Descent (IBD) states, and implements a maximum likelihood of pairwise genetic relatedness in structured populations. Here we develop an R package that implements the InRelate algorithm, along with several other popularly used relatedness estimators. We also test the package using human genomic data from the 1000 Genomes Project.

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368 11:00 am Z

Utilizing Drosophila to investigate the genes behind DiGeorge Syndrome

Brenna Blotz, Biology (U)

DiGeorge Syndrome is a human disease resulting from a microdeletion on chromosome 22. The disease results in symptoms such as facial dimorphism, thymus gland deformations or complete loss, and heart defects that lead to cardiac arrhythmias or arrest in young patients. The goal of the research is to identify other genes involved in the contribution of heart defects besides the known TBx1, also known as org-1, gene. Drosophila melanogaster have a tubular heart with a series of longitudinal fibers that are believed to be the fly equivalent of the human SHF cells. These SHF cells are thought to contribute to the cardiac defects present in DiGeorge syndrome, which makes fruit flies an ideal model to conduct this research. Several fly genes orthologous to the genes included in the microdeletion could be knocked down by crossing together two different fly lines. One fly line is the UAS-RNAi line, which when crossed to a “driver” line known as Gal4, produces offspring that express a structure that suppresses target gene expression by interfering with the gene’s RNA. These offspring can be dissected and stained with fluorescent dye to visualize the cardiac tube. By discerning the phenotypes of the cardiac tubes and counting the longitudinal fibers present in the A3 and A4 regions of the heart field, it can be determined if any of the knocked down genes in combination with org-1 and the Gal4 driver create any cardiac abnormalities. Preliminary findings indicate that the fly lines associated with the genes CG10700 and CDC45L attached to the UAS promoter are possible candidates for genes responsible for defects due to their low longitudinal fiber counts. These low fiber counts would indicate that these genes play a role in Drosophila cardiac formation and hence possibly be important in human cardiac formation as well. Findings generated from this research could be valuable in improving our understanding of DiGeorge Syndrome and could also potentially be greatly beneficial for treatments and therapeutics.

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369 11:00 am AA

Study of the 3D Molecular Structure of Viral Capsid Building Blocks

Caitlin Bartels, Biology (U)

Viruses, the most abundant biological entity, are composed of genetic information surrounded by a protein capsid shell made of repeating subunits that adopt a particular fold. Tailed bacteriophages, used for phage therapy in antibiotic resistant infections, are viruses that infect bacteria and account for 50-90% of all viruses, and share an evolutionary link with Herpesvirales, responsible for multiple human and animal diseases. In these viruses, major capsid proteins (MCPs) adopt the HK97 fold. We can understand the molecular pressure that favors the HK97 fold and how this can be advantageous for antivirals by analyzing its structure. Predicting the molecular structure from lab cultures is difficult, so using viral sequences from environmental samples proves more effective. Two main programs were utilized here. PhANNs uses an artificial neural network of protein sequences to classify a protein structurally. HHpred aligns a given protein sequence that Modeller reads to create a 3D protein fold, components of the MPI Bioinformatics Toolkit. PhANNs is an important tool for systematic analysis of tailed bacteriophages and Herpesvirales from genomic information because it classifies unidentified viral genes by function. Combining these programs allows us to analyze PhANNs as an efficient tool to collect good candidates for HK97 MCPs. After gathering 669 viral protein sequences previously classified as HK97, PhANNs classified these as MCP or “other”, verified using HHpred and Modeller. PhANNs identified these sequences as MCPs with 97.78% accuracy and as “other” with 45.24% accuracy. However, the inaccuracy with the “other” cases only accounts for 6.89% of the entire dataset. Therefore, we can conclude that PhANNs demonstrates a quality ability to classify unidentified viral protein sequences with a small margin of error.

Session G-5

Poster Engineering and Computer Science 6

Friday, March 4, 2022, 11:00 am

Location: Montezuma Hall

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370 11:00 am BB

Stormwater Effects on Drainage Channels

Patrick Fassell, Civil Engineering (U)

There are many ways to sustainably mitigate stormwater impact on the environment and help manage excess runoff that comes from sources in the built environment. One of these methods is by disconnecting downspouts from the local gutter system when possible and instead directing them towards another environment in such a manner that pollutants can be isolated or even used for a good purpose like fertilizing a garden (1). This reduces the overall flow of stormwater and pollutants into the local hydrologic cycle which can help mitigate issues like eutrophication and flooding. In order for this to be effective however it would need to be implemented across residential neighborhoods or in certain large buildings that tend to collect stormwater naturally in order to get the volume needed to cut back on local flooding significantly. In the city of Roseville it would work reasonably well for pollution diversion from the local wetlands and it would also help reduce the volume of water to mitigate flooding in the local catchment basin by serving as a diversion that would benefit people’s yards or potentially agricultural ponds for people so inclined. Another method that could be used to mitigate flooding problems and stormwater pollution is the technique of permeable pavements. This method works by having elevated and permeable pavers, permeable concrete, or permeable asphalt that absorbs rainwater and traps it in a reservoir bounded by a stone slab underneath that serves to collect the rainwater and slows down the natural flow of water which can be controlled by the addition of drainage tiles. Permeable asphalts can help trap pollutants by encouraging biological uptake of the pollutants by plants that grow in the cracks or by physical and chemical methods like reservoirs or microorganisms that change the pollutants into an inert chemical form (2). This can be practically implemented in new construction in the city of Roseville and help reduce pollutant release into the local watershed along with reducing flooding hazards from oversaturated watersheds by slowing the release of water into the local watershed from natural hydrologic processes.

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371 11:00 am CC

Water Table Experiment: Interaction of a cloud of particles with a hydraulic jump

Benny Jaime, Aerospace Engineering (U)

The extreme flow conditions that occur when a shock interacts with an obstacle, make both experimental and theoretical prediction challenging. To mitigate related difficulties, we can use the well-known theoretical analogy between the flow of shallow water to gas dynamics. If the Froude number, the ratio of the shallow water flow velocity as compared to the characteristic gravitational wave speed, and the Mach number, the ratio of the velocity to the speed of sound, are the same, then we can directly compare physics in a water table experiment. The shallow water hydraulic jumps generated in the water table can be directly related to shocks in supersonic flow. Because the conditions in a shallow water table experiment are more benign, the difficulty and cost of such an experiment is far less than the supersonic gas flow experiment. The experimental results are validated with computational data obtained from Ansys Fluent simulations. In our poster, we will discuss a funnel design that will decrease the testing area and improve the uniformity of the flow in the test area. In addition, a hydrogen bubble generator is designed to enable flow visualization of complex flow patterns associated with solid objects or boundaries.

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372 11:00 am DD

Analysis of Pressure and Flow Control on a Truncated Linear Aerospike Nozzle

Jarred Sampayan, Aerospace Engineering (U)

The wake dynamics of a linear truncated aerospike will be investigated; the purpose of this investigation is to understand the flow separations and shock formations on an aerospike and the potential effects of integrating single barrier charge plasma actuators improving the flow control. Experimenting on different spike truncation levels could also lead to optimal design parameters for future industrial applications. Flow controllers have been proven to stabilize and induce more efficient flow across airfoils. Implementing plasma actuators on an aerospike nozzle could minimize drag the aerospike experiences thus improving engine performance. Computational fluid dynamics (CFD) simulations using ANSYS Fluent will be validated against Schlieren imaging results taken from a small-scale experimental model. In future work, the validated CFD setup may be used to simulate the flow controller's effects at higher altitudes.

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373 11:00 am EE

Testing of Synthetic Jet Actuators in an Airfoil

Charles Duddy, Aerospace Engineering (U)

Flow separation can degrade performance in many engineering systems, through reduced lift, increased drag, and decreased efficiency. To minimize flow separation and its effects on aerodynamic performance, active flow control has been considered since the inception of the field of aerodynamics. Open-loop flow control strategies based on various actuator technologies such as plasma actuators, fluidic oscillators, and synthetic jets, have been shown to effectively alter separated flows, and in some cases to even yield complete reattachment. Synthetic jet actuators function through the injection of air along the flow path, aiding in the prevention of flow separation by reenergizing the boundary layer. The objective of this research will be to analyze the effectiveness of piezoelectric disks as synthetic jet actuators with primary focus being on how the disks affect the flow over the NACA 65(2)-415 a=0.5 airfoil. In continuing research, a blade with two integrated synthetic jets on the suction side of the airfoil is investigated. Wind tunnel and PIV testing (particle image velocimetry) is performed to obtain real-world data for the application of synthetic jet actuators in the prevention of flow separation.

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374 11:00 am FF

Consensus-Based Decentralized Auctions for Robust Task Allocation in Urban Air Mobility

Nicholas Agtual, Mechanical Engineering (U)

Efficient and optimal deployment of unmanned aerial vehicles has the potential to advance many transportation systems. In order to have a fleet of autonomous robotic agents successfully complete a set of tasks, cooperation among said agents is vital. There are many methods to solve this assignment problem when agents are able to share their situational awareness among the entire fleet, via some centralized planner. Although centralized systems allow for smaller robotic agents by allocating the majority of the processing on the centralized server, there are limitations to this method. Agents are forced to communicate with a server in a fixed location, thus limiting the possible range of the fleet. Designing a decentralized method to solve the assignment problem not only resolves this issue, but acts as a contingency plan in the case that the centralized server fails.

Many industries including companies such as Boeing, Airbus, and Amazon all covet the ability to transport goods or people for short distances. Due to the high population density of the areas the autonomous fleets will be operating in and the limited battery life of the drones, a method of landing the drones safely and optimally is paramount, especially when centralized servers are down.

The goal of this research is to delve into new decentralized methods to land a fleet of autonomous drones. We scripted a decentralized algorithm than can compute the optimal landing solution for said fleet. This algorithm was constructed using a auction and conflict resolution process. The algorithm was implemented in Python to allow for dynamic use.

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375 11:00 am GG

5G Broadband (4.5-55GHz) High Gain Balanced Antipodal Vivaldi Antenna with 3D Lens

Helena Clavin, Electrical Engineering (U)

Balanced Antipodal Vivaldi Antenna (BAVA) was designed and simulated for the upper 5G NR bands in the 28-47GHz range. The BAVA was designed with a unique teardrop-shaped Teflon lens. Within the 4.5-55GHz bandwidth, the addition of this lens increased the antenna gain to 7-20dBi between 4.5-25GHz and 20-24dBi between 35-55GHz. The resulting 5G New Radio (NR) bands this BAVA could be used for are n79[4.7GHz], n46[5.2GHz], and n96[6GHz] of NR band 1 and n257-262[28-47GHz] of NR band 2.

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376 11:00 am HH

Dual Circular Polarized Wideband Stacked Patch Flat Panel Phased Array Antenna for Ka-Band Applications

Rudraishwarya Banerjee, Computational Science (D)

Circular polarized (CP) electromagnetic waves are preferred for space to space and ground satellite communications (SATCOM) to maintain the reliable communication link. Here, we have designed 8x8 dual circularly polarized phased array antenna (PAA) aperture comprised of sequentially rotated stacked patch antennas. The PAA offers 22-28 GHz bandwidth, with maximum gain of 23 dBic, whereas beam scans till ±50 o with acceptable axial ratio over all scan angles. By utilizing phase shift from the Anokiwave RFICs (AWMF-0165) employed for beamforming network, we have generated both linear polarization and circular polarization as well as beam scan.

Session G-6

Poster Physical and Mathematical Sciences 4
Friday, March 4, 2022, 11:00 am
Location: Montezuma Hall

377 11:00 am II

Optimization of the detection of nicotine in third-hand smoke residues via colorimetric detection

Sergio Renteria, Biochemistry (U)

In the last decade, there has been a resurgence in the use of tobacco products due to the creation and marketing of e-cigarettes. As a result of this resurgence, there is an increased risk of tobacco related diseases. Some of these risks can arise through the exposure to third-hand smoke (THS), the chemical residue of tobacco products that is left behind in the environment after smoking. These chemical residues can contaminate living spaces and have been found in the dust, surfaces, air, and residences that formerly housed smokers. The toxins that occur from tobacco smoke can persist in environments for years, well after a smoker has moved out of the space. This is particularly a concern in low-income communities due to these areas being greatly affected by tobacco consumption and with smoking permitted in lower cost housing. While quantifying the toxins of THS is possible, it is not feasible for in-home testing as current testing of THS is performed in laboratories using samples from the homes, which is costly and inaccessible process for most.

The goal of this project is to create a simple and affordable device, or test kit that any individual could use to obtain a quantitative and qualitative measure of THS residue in their home environment. While there are many chemical traces that can be found due to THS such as butane and cyanide, our target is nicotine due to its large abundance and specificity to tobacco products. Our goal is to develop a colorimetric analysis of nicotine by labeling it with a dye. Our previous research shows that certain classes of dyes can bind to the amine group on nicotine at various pH ranges, and this can be visualized through a liquid-liquid extraction of the nicotine-dye complex. To validate and quantify the labelling of nicotine, the extracted nicotine layer is measured by a UV-Vis Spectrometer to determine the dye complex. While we can positively identify nicotine with this liquid-liquid extraction, we aim to further optimize this extraction method to adapt it to a commercial device where the spectrometer would be replaced with a smartphone. With these results users would be able to determine a qualitative analysis of nicotine residue left in the environment and assess the health risks that this may pose.

378 11:00 am JJ

Study of New AOMedia Video 1 Codec Compression Settings for Future Wireless Streaming

Evan Ballesteros, Computer Science (U)

With the rise in popularity of media streaming services such as Youtube and Netflix and the increase in picture resolution, there has in turn been an increasing demand for internet bandwidth necessary for streaming. There are many methods to approach and aid in this issue of high demand, but one popular way is to use new media compression codecs with higher compression efficiency. The research conducted was in an effort to better understand the newer generation and more efficient media codec, AOMedia Video 1 (AV1). We explored how it could be utilized using data extracted from the encoded media so that the media could be more readily handled using underlying wireless network protocols. This was accomplished by determining methods to alter the quality and size of a video by changing settings within the encoder in order to create several different qualities of streams that correlate with the streaming bandwidth and network resources. Also, one obstacle found when working with AV1 compared to the existing standard codec like H265 is understanding inter-frame dependency. To explain more, H265 works with I, P, B frames as frame types which provide a general idea of the quality contribution that each frame provides to the entire video. AV1 on the other hand only consists of intraframe and interframe types providing no direct definitive way to recognize the frame contribution as it relates to other frames in the video. In this research, we also explore a method to possibly remedy this issue that seeks to represent per frame quality contribution. The method we used expresses a similar pattern to that of I, P, and B frames found in H265, exhibiting frames of high, medium, and low-quality contribution to the entire video depending on specified quality contribution threshold ranges.

379 11:00 am KK

Highest Rated Films Over a Thirty Year Period: A Statistical Analysis of the Significant Predictors of a Film's Rating

Mariela Ponce, Mathematics (U)

This research project examines the data set titled "Highest Rated Films Annually from 1984-2014." The data set consists of 510 films and displays their title, Motion Picture Association rating, genre, budget, gross, runtime, release date, rating, and rating count. The investigation has been conducted using R, a programming language for statistical computing and graphics. The purpose of this study is to explore the factors that influence high film ratings along with visualizing the data in this set. R was utilized for data visualization and multiple linear regression of quantitative variables. Multiple linear regression is a statistical model that examines the relationship between a dependent variable and two or more independent variables. The regression model analyzes if the independent variables of budget, gross, rating count, and runtime have a significant effect on a film's rating. The results of the model indicate that budget, runtime, and rating count are significant predictors of a film's rating, and gross income does not have a significant effect. Scatter plots, histograms, bar plots, and pie charts were created for the purpose of data visualization. Along with visualizing film data, simple statistics were used to determine which movies have the highest and lowest values for each category. Predictions by using several statistical learning models are also performed.

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380 11:00 am LL

Uncertainty Quantification in Nuclear Interactions

Ky Putnam, Physics (U)

Although the interaction between neutrons and protons can be understood in terms of quarks exchanging gluons, the implementation of such interaction for nuclear structure simulations remains out of computational reach. Instead we rely on potential models derived from effective field theories, which provide an approximation to the actual interaction. These models have already been adjusted to fit experimental scattering data, but the parameters obtained have not yet been optimized with their uncertainties that propagate from the experimental data to the adjustable parameters. We are implementing these previously derived potentials so that we can redo the optimization, this time including experimental uncertainties. To do this we will use statistical resampling techniques to generate pseudodata, as we know how scattering experiments generally behave. We expect to obtain uncertainty on parameters of local chiral interactions that other researchers will be able to use to account for uncertainty in their own experimental analysis and calculations.

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381 11:00 am MM

Using Machine Learning Models to Predict Function Values

Erika Gutierrez, Mathematics Single Subject Teaching (U)

Throughout the time of the 2021 Summer Undergraduate Research Program (SURP), we have had the opportunity to implement machine learning algorithms to predict function values. There has been a great deal of research showing the possibilities of using machine learning techniques to analyze theoretical math functions. By providing a certain amount of training data to the machine learning models to train, the needed coefficients can be obtained which contain hidden information of the function. Then, we can use the built model to predict the values of the target function without computing it using the traditional analytical way. We have worked with three specific machine learning algorithms: Neural Networks, Support Vector Machines, and Decision Trees. For the math function, we started with some common functions such as the Sine and Cosine function, for which we know their patterns and they can be used to test the efficiency and accuracy of those machine learning algorithms. Then, we have moved on to work with the Mobius function with small data size. The experiment of predicting the values for the Mobius function by using decision tree and random forest shows promising publishable results. All implementations were conducted on R.

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382 11:00 am NN

A Brief Introduction to Microwave Quantum Optics

Malida Hecht, Physics (M)

Classical microwave circuit theory is incomplete in that it is incapable of fully modeling some phenomena at the quantum level. Various theoretical frameworks can be employed to incorporate single-photon statistical effects in the treatment of microwave networks. Such methods include quantum input-output network (QION) theory and SLH theory. A synthesis of the quantum and classical circuit treatments requires a description of second quantization within classical microwave theory. In order to make these topics understandable to an electrical engineer, we demonstrate some underpinnings of quantum optics in terms of microwave engineering. For example, we relate traveling-wave phasors for transmission-lines, such as voltage and current, to bosonic field operators. The second quantization and necessary components for a quantum treatment of microwave circuit theory are summarized in a table that maps microwave scattering parameters to bosonic operators in a transmission-line. To illustrate the need for second quantization, we use the results of second quantization along with first principles of quantum input-output network theory to determine a state-space representation and a transfer function of a single port quantum network. The same results could be obtained from SLH theory, and this serves as a case study for applying microwave theory to open quantum systems. The results of this work could be used to treat NISQ and other superconducting hardware. Additionally, these results could be incorporated into an applied curriculum, assisting in the engineering education of the future quantum workforce.

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383 11:00 am OO

Statistical Analysis of Stable Nuclei Collision

Nathaniel Saavedra, Physics (U)

When analyzing scattering data, optical potentials can be used to account for the elastic and inelastic components of the scattering process. Optical potentials contain a real and imaginary part. The real part accounts for the elastic scattering while the imaginary part accounts for the inelastic scattering. When analyzing data at scattering energies near the Coulomb barrier, certain research groups have found results that seem to contradict causality conditions. Having a scattering process that violates causality would have very strong implications for the foundational principles of quantum mechanics. Therefore, a careful and judicious analysis of the available data and uncertainties is in order. The uncertainties in the phenomenological parameters are important in drawing conclusions, so it is pertinent that consistent criteria for these uncertainties be used. Bootstrapping techniques will be used to replicate expected experimental data samples, which will then be compared with theoretical data. Once data has been analyzed using the common criteria for experimental uncertainties, conclusions will be compared with those of previous analysis by other groups to confirm or deny the presence of causality breaking. These methods will be applied in particular to the 16C + 208Pb and 6Li + 80Se reactions.

Session G-7

Poster Health Nutrition and Clinical Sciences 4
Friday, March 4, 2022, 11:00 am
Location: Montezuma Hall

384 11:00 am PP

Factors Affecting Attrition from Telehealth Among Older Adults

Tiffany Chin, Master of Public Health in Health Management and Policy (M)

Introduction: The COVID-19 pandemic launched many healthcare facilities into adopting telehealth into their daily practice to continue giving people a way to access healthcare services. Ideally, telehealth has the potential to be a crucial modality for reaching patients who already have barriers to accessing healthcare services and may allow for higher levels of compliance with their medical care plan. However, not every patient has adapted to this new method for delivering healthcare services. The purpose of this study is to investigate what factors lead to attrition from telehealth services among older adults.

Method: A retrospective cohort study was conducted on 32 participants who were enrolled in Westchester's Telehealth Intervention Program for Seniors (TIPS). These participants were surveyed during the COVID-19 pandemic to assess their intent in joining the program, factors causing them to leave TIPS, and factors that may prompt them to rejoin the program. The collected data and demographic information were then analyzed using SAS 9.4, where a Fisher's exact test was used to assess for statistical significance.

Results: Among the reasons participants were asked to see why they quit the program, the highest factor was due to COVID-19 reasons (56.3%). This was followed by participants preferring to meet in person instead of over the phone (50%), participants no longer being interested in the program (28.1%), and participants feeling like they were healthy enough to not need this service (21.9%). A statistical significance was seen (p-value = 0.03) when comparing COVID-19 vaccination status against the participant's intent to rejoin TIPS.

Discussion: The results of this study suggests that a majority of participants quit utilizing TIPS due to COVID-19 reasons and preferred to utilize healthcare services in person rather than through telehealth. The statistical significance between the two variables further indicates the problem with not being in-person during the COVID-19 pandemic as the reason why participants left the telehealth program. This implies the possible need for better education on the use of technology among older adults to overcome the technological skill barrier for this population to receive access to healthcare services.

385 11:00 am QQ

Impact of COVID-19 pandemic restrictions on the start of treatment after cancer diagnosis for patients enrolled in IRB approved study at UC San Diego, Moores Cancer Center Biorepository

Matyas Hanna, Microbiology (U)

UC San Diego Moores Cancer Center Biorepository (BR) is a College of American Pathologists (CAP)-Accredited core, operating under a UC San Diego IRB-approved protocol. The BR staff consent patients, collect and annotate biological specimens, and store and distribute samples to the research community. In 2018, the Minority Outreach Research Effort MORE) was launched to increase minority participation in research while analyzing cancer type and patient perspective of research. From February to March 2020, the BR had a 98% decrease in enrollment for research as Covid-19 limited patient appointments and staff coverage. We hypothesize patients' treatments to be impacted after cancer diagnosis due to pandemic restrictions. We proposed to analyze 300 patients' ethnicity (Hispanic/Non-Hispanic), cancer staging, cancer type, treatment, and language preference to determine possible impact on the treatment times due to the pandemic restrictions. The BR identified and pre-screened (HIPAA waiver) potential patients from oncology clinics with the help of treatment teams. Eligible patients were interviewed by coordinators to obtain Informed Consent (IC) using an IRB-approved protocol. Patients' data like their age, ethnicity, encounters and other background/medical information were obtained from the UCSD Epic electronic medical records and analyzed. Based on preliminary data, cancer patients receiving chemotherapy, surgery, or radiation spent less time waiting for treatment after cancer diagnosis compared to pre and post-Covid restrictions. During Covid-19 restrictions, cancer patients had a ~25% decrease in wait time when compared to pre-Covid-19 restrictions. In contrast, patients saw a ~15% increase in wait time during Covid-19 vaccinations. Pre and post Covid-19 restrictions, non-Hispanic patients experienced a ~25% and ~21%, retrospectively, higher wait time than Hispanic patients. To further determine the impact of Covid-19 on biorepository cancer patients, further research will propose to analyze the amount of telemedicine occurrence during Covid-19 restrictions. In addition, further data like patients' socioeconomic status and language preference can be analyzed to demonstrate any health disparities.

386 11:00 am RR

Parental Attitudes on Genetic Testing on Pediatric Cancer Patients

Sydney Olfus, Biology (U)

Background: There is significant clinical utility associated with genetic predispositional testing in cancer patients, including prevention of adverse medical outcomes and proactive treatment planning. Given the varied implications of positive versus negative test results, it is valuable to consider potential benefits and risks associated with genetic testing, especially for children who cannot make autonomous decisions. This study aims to assess parent beliefs regarding genetic testing for pediatric cancer patients.

Methods: A study was conducted where patients and their parents received genetic counseling, then genetic testing was conducted on the patients. A survey, administered to parents at three points during the study, aimed to address parent attitudes and beliefs regarding genetic testing. The present study examined responses from six questions in the baseline survey that address beliefs about genetic testing decisions and whether test results should be disclosed to children. Parental responses were compared on six demographic factors: ethnicity, gender, insurance, employment status, income, and education level. One-way ANOVAS and descriptive statistical analyses were conducted to identify significant differences across demographic variables for each question in the baseline survey.

Results: A total of 95 parents completed surveys at baseline. Overall, parents agreed that parents, rather than children, should decide whether or not children should get tested for genetic predispositions. On average, Hispanic parents were more likely than non-Hispanic parents to endorse communicating test results to their children. Across questions, unemployed parents were more likely than employed parents to endorse involving children in the genetic testing decision-making and revealing test results to their child. Parents with Medicaid insurance, compared to parents with private insurance, were more likely to agree that their child should be involved in genetic testing decisions. There were no significant differences between the average responses of male and female parents.

Discussion: Overall, parents believed that they should make the decision in their child's genetic predispositional testing and that their child should be told the test results, although strength of these beliefs varied across sociodemographic variables. Health care professionals should be aware of these differences in order to improve discussions of genetic testing with patients and their parents.

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387 11:00 am SS

Recommendation of HPV Vaccine to Hesitant Parents: Pediatrics versus Family Medicine Providers

Shakirah Williams, Public Health (U)

The Human Papillomavirus (HPV) vaccine has the ability to prevent six types of cancer and yet the target goal of 80% complete vaccination has never been reached. Although this can be attributed to various factors, how the vaccine is discussed with parents plays a huge role in vaccine uptake. Our objective was to examine how family medicine (FM) and pediatric (Pd) providers recommended the HPV vaccine and what differences, if any, there were between specialties. SAS, a statistical software, was used to analyze an electronic survey (Qualtrics) completed by 54 (69.23%) Pd and 24 (30.77%) FM providers. Two out of thirty-four questions were used to identify which resources/tools and effective messages were used when speaking to hesitant parents. A significant difference was shown when pediatric providers preferred to use educational brochures (54% versus 25% FM, p=0.02); posters (37% Pd vs 8% FM, p=.009); and, a website parents can access (56% Pd vs 29% FM, p=0.03). Seventy percent of pediatric and 88 percent of family medicine providers mentioned cancer as the most effective way of persuading parents to let their child receive the HPV vaccine. For this question, both were effective in mentioning cancer prevention as a future health concern. It is important to note, there was a smaller group of FM providers completing the survey, and thus there is a limitation in comparing the two groups. In conclusion, due to the variety of educational tools that pediatric providers use, they are able to tailor their delivery methods to patients/parents since they focus on patients under 21 years old. Family medicine providers do not use the same variety of resources due to their population being any age. This allows pediatric providers to give stronger recommendations than family medicine providers. (Kempe et al. 2019).

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388 11:00 am TT

Measuring food insecurity in Latinx families: expanding understanding of their experiences through exploratory interviewing and cognitive testing

Brianna Flores, Foods and Nutrition (U)

The household food insecurity, when limited food is available and households are uncertain about their next meal, affects 10.5% of households in the United States and a larger proportion of Hispanic/Latino households (17.2%). U.S. Food insecurity prevalence is estimated using the Household Food Security Survey Module (HFSSM). However, the HFSSM has never been cognitively tested with Hispanic/Latino households, limiting our understanding of how well the HFSSM assesses food insecurity among Hispanic/Latino households. The purpose of this study was to understand how Hispanic/Latino caregivers perceive and interpret the HFSSM measurement items and how well these items capture their varied food insecurity experiences. The research team conducted semi-structured interviews using a qualitative approach with a cross sectional study design. Targeted within the Hispanic/Latino caregivers using exploratory and cognitive interviewing techniques to understand their perceptions and interpretations of the HFSM. In addition to their experiences related to the four core domains of food insecurity. Recruitment and data collection for this study began in Fall 2021. Across the three sites, a total of X participants have completed interviews. This is important to inform policy and understand Hispanic/Latin caregivers in urban communities. Also, to be conscious of the higher rates in food insecurity measurement within the urban Hispanic/Latin population. In addition, to help future research obtain lower food insecurity rates with Hispanic/Latino communities.

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389 11:00 am UU

Food cravings are mediated by sensory mental imagery in reward sensitive adults

Kyra Jensen, Foods and Nutrition (U)

Food cues play a crucial role in contributing to obesity in the modern food environment. Especially those individuals with heightened sensitivity to rewards show increased cravings towards these external food cues. Empirical data also suggest that an intense desire to eat a specific food can be induced experimentally by instructing participants to create vivid mental (sensory) images of the appetitive target. However, it is unclear if heightened reward sensitivity affects one's urge to eat craved foods in presence of cues, by triggering a shift in sensory imagery processes. In a cross-sectional data survey collected using Qualtrics, we investigated if individuals with high reward sensitivity show greater food cravings and if this relationship is mediated by the ability to create vivid mental images of presented odor and food cues. Reward sensitivity was measured using Sensitivity to Reward Questionnaire and craving was measured using the Food Craving Inventory Questionnaire. Vividness of mental imagery for odors and foods was determined by validated Vividness of Olfactory Imagery Questionnaire and the Vividness of Food Imagery Questionnaire. Data was analyzed using the regression and parallel mediation analysis with 5000 bootstrapping resample sets. Our sample (n=169, 51% females) included adults with mean age of 31.86 yr and mean BMI of 26.48 kg/m2. Over half of our sample was categorized as overweight or obese. VOIQ scores positively correlated with VFIQ ($p<0.001$) suggesting similarities in sensory imagery modalities. As expected, sensitivity to reward score was positively associated with food craving ($B = 1.26$, $p = 0.00$). Results also found that sensitivity to reward was positively associated with both VOIQ ($B = 0.61$, $p = 0.00$) and VFIQ ($B = 0.19$, $p = 0.01$). The direct effect of sensitivity to reward on food craving was found to be significant ($B = 1.26$, $p = 0.00$) along with the total effect of the model ($B = 1.44$, $p = 0.00$). Our findings suggest that the ability to imagine olfactory and food imagery mediate the relationship between reward sensitivity and food craving. Testing interventions to reduce vividness and craving ratings in reward sensitive adults may be beneficial to prevent future weight gain.

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390 11:00 am VV

The Impact of Pre-existing Dementia on Lung Cancer Treatment Decisions among Older Adults (65+)

Shivani Patel, Health Management & Policy (M)

Lung cancer is the leading cause of cancer deaths of all cancer types. Lung cancer patients also have the highest prevalence of comorbidities compared to other cancers. Dementia is a specific comorbidity that can complicate cancer care due to various barriers such as complexity of care, lack of uniformity/ confusion in care, scarcity of dementia documentation in electronic health records and delays in cancer treatment times. The purpose of this study is to investigate how pre-existing dementia impacts treatment decisions among older adults diagnosed with lung cancer.

The SEER-Medicare linked datafile was utilized to study patients with lung cancer (n=105,689), in addition we identified patients with comorbid (pre-existing) Alzheimer's Disease and Related Dementias [ADRD] (n=5,454). We explored independent social and demographic factors (e.g. age, cancer stage, chronic conditions, and ADRD status among others) and their relationship to surgical decision-making (reason for no surgery), using SAS 9.4. Chi-square and Fisher's-exact tests were used to compare independent variables by ADRD status.

Lung cancer patients with comorbid ADRD were significantly more likely to not receive radiation and/or surgery (5.39%) compared to cancer-only patients ($p<.0001$). Patients with comorbid cancer and ADRD were more likely to have an unstaged cancer (9.04%) compared to stage 1 (5.61%), 2 (4.70%), and 3 & 4 (4.97%), have 2 or more comorbidities in addition to dementia (7.62%) compared to 1 or fewer comorbidities (2.85%) and be over the age of 85 (11.42%) compared with cancer-only patients. Additionally, lung cancer patients with ADRD were significantly less likely to receive surgery due to patient/guardian refusal (8.84%) compared with cancer-only patients. Patient with comorbid cancer and ADRD were also more likely to be advised against surgery due to other conditions (5.67%), be recommended but patient died (7.06%), unknown if surgery was performed (6.91%) and unknown why surgery was not performed (5.15%).

We found that pre-existing dementia may significantly impact treatment decisions among older adults with lung cancer. Additional research is needed to understand how quality cancer care for patients with comorbid dementia is essential for improving documentation/identification of patient needs, aiding treatment decisions, and providing healthcare quality improvements for this population.

Session G-8

Poster Humanities, History, Literature, Philosophy / Creative Arts and Design 6

Friday, March 4, 2022, 11:00 am

Location: Montezuma Hall

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391 11:00 am WW

Social Justice Conflict and Family Dynamics

Katherine Chen, Communication-Liberal (U)

The study seeks to reflect on the researcher's own experience in communicating social justice issues with their conservative family members, to investigate the relationship between cultural gaps and conflict. Multiple similarities are found when conducting interviews are the commonality of low communication accommodation, families are high in immediacy, but low in both intimacy and closeness, the feeling of being an out-group when communicating and finally high value in conformity within asian family households. Families low in closeness, or intimacy suffers from communication issues, which negatively affects family dynamic. Person who feels like an out-group within a family dynamic, can lead to mental health issues, and low communication satisfaction within the family. Low communication accommodations from both communicating parties causes more conflict. Families who are high in conformity suffer more from low communication satisfaction compared to families who value more independency.

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392 11:00 am XX

How to use history as a guide to forestall our inevitable collapse?

Savannah Castleman, Anthropology (U)

All complex societies ultimately collapse. Today, the main factors that can cause our complex society to collapse are the unpredictable factor of intrusion, population-killing diseases, and the most tragic, environmental deterioration. The reason intrusion is brought up is because intrusion brings diseases. For example, the English settlers brought livestock like cattle to the new world in the 17th century. At that time, livestock like this was never seen in the Americas. Living within the cattle are diseases known as zoonotic diseases. Zoonotic diseases stem from animals, like tuberculosis, measles, smallpox, and many more. (Sobo). The Native Americans had no immunity to these diseases due to lack of contact with these animals. Soon, the Native American population diminished, making it easier for the English to expand on the native land, causing the collapse of many native cultures. The threat of intrusion is always a possibility, but through past experience, we can study zoonotic disease to learn how to prevent further pandemics and epidemics. By considering the missteps other civilizations have taken in the past when encountering intrusion and disease along with studying the diseases harboring within animals, we can refrain from the factor of disease being the cause of our societal collapse. We can then turn our focus on environmental deterioration, which is a factor that can not only collapse our society but collapse our planet. The goal of this research is to use history as a guide so that our inevitable collapse doesn’t happen within our lifetime. My methodology is incorporating historical and anthropological literature to further understand societal collapses caused by zoonotic diseases. In turn, this will draw a focus to studying animals to make zoonotic disease less of a threat. So we can then concentrate our research, still through historical and anthropological reports, into Indigenous sustainability practices to take steps into helping the environment rather than hurting it.

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393 11:00 am YY

Humanitarian Critique of the Economic Sanctions on Cuba

Ysabel Gonzalez, Political Science (M)

For my thesis, I have proposed to evaluate how shifts in economic embargoes over time have correlated with changes in Cuban government policies and with changes in economic realities among the population. The project will examine the span of time from the Carter administration to the Trump administration. I hypothesize that eras with strengthened economic embargoes also had increases in poverty. I also expect to find that the strengthening or loosening of economic sanctions had much less impact on Cuban government policies and practices. If so, economic sanctions effectively target the nation’s most vulnerable populations more than the government. This research will contribute to scholarship on “soft power” in international relations, adding a humanitarian perspective.

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394 11:00 am ZZ

Sending It ‘Round Again

Cynthia Bloodgood, Master of Fine Arts in Technical Direction (M)

This is a survey of existing programs and groups used to repurpose, recycle, resell, and reuse items from the theater and film industry that are no longer needed by their original organization, instead of sending them directly into the waste stream. This is also an attempt to identify generalities in structure across different groups and online platforms, and identify effective techniques in organizing and sharing information, and distributing items, either for pay or for free. This survey primarily focused on groups in North America, but may also include groups in other parts of the world.

My goal is to gather useful information for people interested in doing this sort of work, so they can create more effective programs and groups based on successful models that already exist.

SRS

Abstracts of Presentations

Session H

San Diego State University

Session H-1

Poster Behavioral and Social Sciences 16
Friday, March 4, 2022, 1:00 pm
Location: Montezuma Hall

395 1:00 pm A

Social Determinants of Health and Veteran Suicide: An Application of California Health Interview Survey Data

Eamonn Hartmann, Public Health (M)

Introduction: Veterans die by suicide at a higher rate than non-veterans. While existing research has primarily focused on the effects of mental health issues on veteran suicide, the effects of social determinants of health (SDoH) such as financial security, housing status, and education access have not been examined at great length. Thus, the objective of this study is to explore the relationship between SDoH and veteran suicide.

Methods: Data from 11,640 self-identified veterans who participated in the 2015-2019 California Health Interview Survey was analyzed. The primary outcome variables were suicide ideation and behavior in the past year. Correlates of interest included age, sex, education, marital status, race/ethnicity, poverty level, housing status, insurance status, neighborhood safety, social cohesion, civic engagement, current psychological health symptoms, prior treatment experiences, and prior history of suicidality. Descriptive statistics were computed for all variables. Univariate and multivariable regression models were computed to identify correlates of past year suicidality.

Results: The mean age of respondents was 67.63 and the majority were male (91.3%). Three-fourths (75.2%) identified as White, Non-Hispanic while 10.5% and 6.1% identified as Hispanic and African American, respectively. 297 (2.6%) endorsed suicide ideation in the past year and of those, 22 (0.2%) reported suicide behavior in the past year. 389 (3.3%) disclosed a suicide attempt in their lifetime. Univariate analysis revealed significant associations between suicide ideation and age, education, race/ethnicity, marital status, poverty level, housing status, neighborhood safety, social cohesion, current psychological health symptoms and prior treatment experiences ($p<0.05$). Suicide behavior was only significantly associated with expressed need for help with mental health ($p<0.05$). No variables remained significant in the multivariable analysis.

Discussion: The findings of this study build on previous research that demonstrates an association between certain SDoH and veteran suicide. Therefore, the need to address these factors is essential in the context of veteran suicide prevention.

396 1:00 pm B

Comparing Suicidality and Attachment Styles within a Sample with Adverse Childhood Experiences

Shea O'Donnell, Psychology (U)

Those who have encountered adverse childhood experiences (ACEs) are at higher risk of attempting suicide and having suicidal thoughts (Benckowski et al., 2020; Cluver et al., 2015; Fuller-Thomson et al., 2016). Furthermore, those who experience suicidal ideation are more likely to have an insecure attachment (anxious and avoidant) when compared to those without suicidal thoughts (Lessard & Moretti, 1998; Sheftall et al., 2014), and those with secure attachments report little to no suicidality (Lessard & Moretti, 1998). There is limited research on how suicidal ideation manifests within those who have experienced an ACE and who have an insecure attachment style, compared to their securely attached counterparts, despite many studies looking at these topics separately. We hypothesized that attachment style would impact suicidal ideation. Specifically, having an insecure attachment would be related to higher suicidality within our sample. Participants ($n = 282$) answered an online survey via Qualtrics using questions from the Adverse Childhood Experiences (ACE) Questionnaire, the Experiences in Close Relationships Scale-Revised (ECR), and question #9 from the Beck Depression Inventory (BDI). A One-Way ANOVA showed a significant effect of attachment style on suicidal ideation, $F(2,279) = 4.972$, $p = .008$. A Tukey posthoc test displayed that the likelihood to experience suicidal thoughts was higher among participants with an anxious attachment style ($M = .46$, $p = .005$) compared to individuals with secure ($M = .16$) and avoidant attachment styles ($M = .39$, $p = .654$). A Fisher's Exact test was also conducted and showed that among those who have experienced an ACE, there was a significant association between suicidal ideation and attachment styles ($p < .001$). In this sample, 31.9% reported experiencing suicidal ideation (passive and active). Additionally, it revealed that those with an anxious attachment style had the highest thoughts of suicidal ideation with intent (4.4%) and without (35.3%) compared to participants with a secure attachment (3.3%; 6.6%) and an avoidant attachment (2.4%; 32.9%). These results partially support our hypothesis, as we found that only those with anxious attachment, and not an avoidant attachment, experienced more suicidal ideation than those who were securely attached.

397 1:00 pm C

The Association Between Economic Stress and Episodic Memory

Samantha Rae, Psychology and History (U)

Loss of episodic memory has been found to be an important preliminary diagnostic marker for neurodegenerative diseases and disorders, such as Alzheimer's Disease (AD) and Post Traumatic Stress Disorder (PTSD). As such, it is important to identify which populations are most at risk for episodic memory loss writ-large, especially if this population includes that of underprivileged communities, which have higher likelihoods of being overlooked in academia. The current study explores how economic stress and accuracy of episodic memory relate. Within a Qualtrics survey, economic stress was measured by a self-reported placement within an income bracket range in the levels of $0 to $19,999, $20,000 to $39,999, $40,000 to $59,999, $60,000 to $79,999, or $80,000 to any dollar number higher. In the survey, accuracy of episodic memory was measured by the self-reported percentage correct on the MemTrax online memory CRT test. No significant association between family-related income stress and episodic memory was found, r(114) = .03, p = .377. Additionally, no significant association between personal-related income stress and episodic memory was found, r(98) = -.10, p = .153. Although these findings were not significant, it is still important to look into research of this kind. With continued research into this field of study, more conclusive treatments for neurodegenerative diseases and disorders may be developed as the populations most affected become more isolated and subsequently more studied. This study was one of the first of its kind, particularly in its combined usage of the Memtrax online memory CRT test and of its focus on income-related stress. That being so, this study may serve as a valuable pilot for future studies.

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398 1:00 pm D

Sexual orientation and Self-rated health

Savannah Taylor, Sociology (M)

Previous research has shown that sexual minority adults are more likely to experience health conditions and poor mental health, and it is thought that this is a result of experiencing minority stress due to discrimination and that they are more likely to engage in negative health behaviors. Understanding health disparities for different marginalized identities is crucial to motivating policy towards a more equitable health system. The purpose of this study was to use a nationally representative data set to identify health disparities through differences in self-rated health across adults who identify as a sexual minority compared to their Heterosexual counterparts. The data analyzed comes from the 2019 National Health Interview Survey, a cross sectional interview survey, with a total sample size of 26,099 adults. This data is analyzed using ordinary least squares regression, across four different regression models. These models separate mechanisms that could explain differences in self-rated health including demographics, socioeconomic factors, health risk factors and behaviors, and access to care. The main hypothesis was that sexual minority adults, defined as “Lesbian or Gay”, “Bisexual”, “Something else” or “Don’t know”, would report worse self-rated health than Straight individuals; however, the results showed that this was not true for Lesbian or Gay individuals, despite what previous literature would suggest. The main findings did indicate that Bisexual individuals and individuals identifying as “Something else” or “Don’t know” do experience worse self-rated health compared to Straight individuals, which supports the main hypothesis for this study. This disparity was eliminated when factoring in health risks/behaviors and mental health as well as access to care, with the exception of individuals who identified as “don’t know”, meaning that these are the main mechanisms that explain health disparities observed in LGBT adults–but that there is still something to be explored in regards to liminal and undefined sexual identities. Mental health advocacy and access to health care and social safety nets should continue to be a focus for health policy and efforts to eliminate health disparities for sexual minority adults.

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399 1:00 pm E

Examining the Emotional Labor Performed by Probation and Parole Staff

Alexandra Spencer, Criminal Justice and Sociology (U)

The work of probation and parole officers is critical to enhancing public safety. While much research considers this work in the form of procedures, practices, and role alignment (like social worker versus law enforcement), little research has considered the emotion work community corrections officers engage in. With Hochschild’s concepts of emotional labor and emotion work as a theoretical framework, this study relies on in-depth interviews with probation and parole staff at all levels of a state-wide agency to understand the types of emotional labor they engage in. Using a thematic analysis approach and NVivo, this study found patterns of emotion work emerge in participant descriptions of their occupational and organizational identities. The results of this study concluded that women described their occupational identity in more varied ways than men, who more typically described themselves by their technical role in the organization, as well as perceived the organization in a more positive light. Black participants and Central Region participants viewed their roles in more creative ways than other demographic groups. Unexpectedly, no relationship was found between employment role and occupational identity or organizational identity. The results of this study can inform future research and organizational strategies to understand and improve role alignment and the content of work in community corrections organizations.

Session H-2

Poster Behavioral and Social Sciences 17

Friday, March 4, 2022, 1:00 pm

Location: Montezuma Hall

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400 1:00 pm F

The Effect of Adverse Childhood Experiences on Perceived Discrimination

Alejandra Gonzalez, Psychology (U)

Adverse Childhood Experiences (ACES) have been reported to impact one’s mental and physical health negatively. With previous literature investigating these implications, a new area has emerged linking the effects of ACEs to perceived discrimination (Campbell et al., 2020; Vásquez et al., 2019).

Through the development of the Intersectional Discrimination Index (InDI; Scheim & Baeur 2019), the present study investigates the effect of ACEs on perceived discrimination. We hypothesized that the presence of ACES would increase the likelihood of perceived discrimination. Data were collected from participants (n=250) through an online self-report questionnaire administered in a psychology course at San Diego State University. The questionnaire consisted of the ACEs scale (Felitti et al., 1998) and the InDI. The InDI consists of three scales that measure anticipated discrimination (InDI-A), day-to-day discrimination (InDI-D), and major lifetime discrimination (InDI-M). Utilizing three Pearson bivariate correlations, there was a significant, negative relationship between ACEs and InDI scales scores. The results are as follows: InDI-A, $p = .011$; InDI-D, $p < .001$; InDI-M, $p < .001$. As such, the data suggests that the more ACEs one has, the less perceived discrimination they may denote. This finding highlights the multi-faceted reach of ACEs and how they may create a lack of appraisal for discrimination and/or resilience. Future research may further investigate the formation of resilience from ACEs.

Keywords: adverse childhood experiences, perceived discrimination, discrimination, trauma

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401 1:00 pm G

Mother's vs. Father's parenting strategies influence regarding Latina daughter's PA levels

Maryam Aso, Criminal Justice (U)

Only 26.1% of US adolescents meet current Physical Activity (PA) guidelines (≥60 min daily moderate-to-vigorous physical activity), with fewer girls (17.5%) meeting the guidelines than boys (35.3%) (Kann et.al, 2018). Preadolescent Latina girls are known to have below-average levels of PA; Low PA levels can lead to obesity(Ladabaum et al, 2014), cardiovascular disease (Fletcher et al, 2018), and cancer(Kerr et al, 2017), so it is important to promote PA and healthy habits. Health behaviors of girls aged 8-11 can be influenced by their parents and other family factors. The purpose of this research is to reveal family factors that influence the level of PA amongst Latina adolescent daughters. Specifically, it explores if the mother or the father figure's parenting strategies are more prominent and influential regarding the daughter's physical activity levels. PA levels for N=45 girls were measured with Actigraph accelerometers and surveys with mothers and daughters measured parenting strategies for PA used by mothers and fathers (e.g. Do you encourage your daughter to exercise? Do you praise your daughter for getting involved in PA activities?). Surveys also collected demographic information about many factors concerning families and parents such as socioeconomic status, family size, mother's marital status, age, and education level. Regression will be used to examine the correlation between mothers' and fathers' use of parenting strategies and girls' PA levels and determine which parent's behavior is more closely associated with the daughter's PA levels. Thus, this project will offer an understanding of how family dynamics and household gender roles impact the daughter's overall physical activity. As we gain an understanding of how family dynamics and parental influences shape the daughter's PA levels, we can implement intervention programs that can help parents understand what steps must be taken to increase PA in preadolescent girls.

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402 1:00 pm H

Improving Program Attendance Among Latina Mothers And Daughters

Loany Osorio, Psychology (U)

With the increase of technology, virtual health programs is a feasible option for many communities. The Conmigo study, a virtual health and wellness intervention program, focuses on helping improve physical activity of Latina mothers and their 8-11-year-old daughters. The goal of this study is to examine the factors that influence program attendance among mother-daughter dyads. In this study, 22 mothers and their daughters, were enrolled on online weekly intervention sessions, which lasted 12 weeks. Participant attendance was recorded at each of the sessions; demographic information about mothers and daughters such as education level, BMI, income, language preference, age, place of birth, and employment was collected. Participants were divided into 2 groups: 1.) regular attenders (<75%) of intervention sessions and 2.) non-attenders. Preliminary findings suggest that non-attenders were less likely to attend sessions if the mother was a non-college graduate and if daughter had higher BMI. Understanding these factors can inform strategies to increase program engagement among those enrolled in health programs.

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403 1:00 pm I

Identifying and Improving Low Engagement in Online Physical Activity Programs Among Latina Youth: What can we do to make it more fun and engaging for them?

Fernanda Cardona, Speech, Language, & Hearing Sciences (U)

Throughout the time of the Conmigo Project, which is an online PA (physical activity) program designed to assist Latina mother and daughter dyads become more physically active and involved in their health, there have been instances in which mother-daughter dyads drop out of the program before fully completing it due to the daughter not being engaged or not finding it fun enough. Because of this reoccurrence, it is important to take a look into daughters' engagement as they play a major role in the program and its overall outcome. This research study is aimed to investigate what changes we could make in order to boost daughters' engagement and program participation. We will be looking through our program content and analyzing whether or not the content is appropriate and/or relevant for the daughters enrolled in our program who are Latina and are of the ages 8-11. We will also be looking through interviews of the participants to see if any comments or suggestions were made to make the program more engaging for the daughters. Similarly, we will be going through transcripts of our Community Advisory Board meetings as well as Investigator meetings to see if there are any additional comments or suggestions that were said regarding daughters' engagement. For qualitative data, we will be calculating descriptive statistics (e.g. percentages). As part of our discussion, we will also be adding existing literature and references to papers about strategies on how to maximize PA engagement for young girls. Our preliminary results demonstrate that there is plenty of room for improvement in regards to boosting daughters' engagement and participation. Through the analysis of our interviews, meetings, and literature/references, we expect to identify and provide the key components and strategies that will improve engagement among Latina youth in regards to their participation in an online PA program. We anticipate that this will also have a positive impact on how many dyads will fully complete the online PA program and receive the full health and well-being benefits that come with participating in one.

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404 1:00 pm J

Depressive Media: Internet use and Depression

Steve Benitez, Sociology (M)

In the United States, internet use is a vital component of day-to-day life. With many individuals reporting that internet usage is vital for not only occupational purposes, but for social purposes as well. High rates of internet use (which includes social media use) has been linked to a variety of mental and physical health issues. Using data from the 2016 cycle of the General Social Survey (GSS), and utilizing Ordinary Least Squares Regression, this analysis attempts to see: 1) Which social media platform(s) is/are associated with higher levels of depression 2) If the length of time on the internet spent per week is associated with levels of depression. The results from the regression analysis found that: 1) Out of all social media variables tested, those with Facebook, Snapchat, or Vine accounts showed to have statistically significant increases in depression 2) More time spent on the internet in general does not necessarily lead to higher levels of depression. However, when controlling for the demographic variables, then there is a statistically significant increase between the amount of general time spent on the internet and depression. These findings seem to suggest that general internet use is not a strong indicator of depression, rather, what a person specifically uses the internet for, combined with the participant's demographic factors (primarily income), is more telling in regards to levels of depression.

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405 1:00 pm K

Impact of Social Media Follower and Like Count on Body Satisfaction

Grace Weatrowski, Psychology (U)

Prior research has revealed the negative impact social media has on the body satisfaction of young adults, but fails to acknowledge further components that contribute to this phenomenon. The current study focuses on the relationship between an individual's social media follower and like counts and their body satisfaction. It was hypothesized that a higher follower count would yield higher body satisfaction. It was also hypothesized that higher body satisfaction would correlate with less concern regarding like count on social media posts. A total of 327 undergraduate students from a Southern California university completed an online survey regarding their personal body satisfaction and their cognitions concerning social media followers and likes. Findings revealed no significant relationship between participants body satisfaction and follower count; however, findings revealed that as participants body satisfaction decreases, they feel more disappointed when their personal social media content fails to receive their desired number of likes, p = 019. These findings suggest that follower count does not significantly impact young adult body satisfaction in the same way as like count. Implications of this study include the notion that social media websites should acknowledge the way the features of their platform, specifically like count, can harm the body image of their users.

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406 1:00 pm L

Effect of food cue exposure on dietary intake and related markers among adults with overweight and obesity

Monica Wilson, Food Science and Nutrition (U)

Increasing obesity rates in the US parallel the rapid expansion in media usage, such as television (TV) viewing and playing video games (VG). Research suggests that passively viewed content on TV with embedded food cues (e.g., cooking shows) influence eating behavior and increase calorie intake. However, with a recent surge in active engagement with food cues in form of games and pictures on phone, the resulting effects on dietary intake are unclear. Here, we aim to examine the effect of immersive food-based VG and passive TV food content viewing on dietary behaviors. In this ongoing pilot study, we enrolled participants with overweight and obesity (body mass index 25-35kg/m^2, 18-40yr) to participate in three separate lab visits: 1) passive food-TV condition included watching a cooking show for 20 minutes (f-TV), 2) immersive food-VG condition (f-VG) included playing an interactive food based game for 20 minutes, 3) neutral non-food TV (nf-TV) included watching a nature show for 20 minutes. At each visit we collected ratings for appetite and food cravings before and after the exposure to each condition. We measured saliva production using the dental rolls placed in mouth for 2-minute while being exposed to food smells. We also measured food intake in a buffet setting after exposure to each condition. In these preliminary results a total of 7 (mean age 25.5 yr; BMI 29.5 kg/m2) participants have completed the study. Within the conditions, heart rate declined significantly in f-VG (p=0.024) and nf-TV (0.030), but not in f-TV. Saliva production did not change after exposure to any of the condition, while food craving scores increased in both f-TV (0.03) and f-VG (p=0.02).

Hunger increased fTV (0.05) and fVG (p=0.05), and fullness and satisfaction ratings decreased (p<0.05) in both. We did not observe any difference in calorie intake from healthy and unhealthy snacks after the exposure to each condition. Participants felt equally focused, immersed, and involved in all experimental conditions. Our results suggest a change in dietary variables in both food cue exposure conditions as expected with no differences between conditions.

Session H-3

Poster Biological and Agricultural Sciences 11
Friday, March 4, 2022, 1:00 pm
Location: Montezuma Hall

407 1:00 pm M

Developing A Novel Wnt Mimetic Using Tcdb

David Anjakos, Molecular and Cellular Biology (U)

The creation of induced pluripotent stem cells (iPSC) has opened new opportunities and possibilities in regenerative medicine and personalized medicine, such as tissue engineering, disease modeling, and drug testing. To facilitate these new techniques, scientists have to unravel and dissect the many signals that induce specific genes expression programs controlling distinct cellular fates. Wnt (pronounced wint) genes encode a family of proteins critical to stem cell function, cell fate, cell proliferation, and cell migration. Mutations in Wnt genes and associated downstream signaling components have been linked to a host of diseases, such as cancer, osteoporosis, and developmental abnormalities like Robinow syndrome, to name a few. Wnt proteins are lipid-modified secreted growth factors with a limited range of activity. Unfortunately, due to Wnts' lipid modification, their isolation and purification require detergents, which complicate research and therapeutic applications. To solve this issue, our lab is utilizing antibody engineering to generate Wnt mimetics that are capable of activating downstream signaling. Previously our lab developed a Wnt mimetic that activates a single Wnt signaling pathway by binding with Frizzled 7 (FZD7) and the coreceptor, LRP6. We are expanding on this technology by generating Wnt mimetics that target multiple FZD receptors. Our next mimetic utilizes the toxin B (TcdB) protein of Clostridium Difficile, which preferentially binds FZD 1, 2, and 7. We have confirmed the production of our protein in HEK-293 cells via Western Blot, and are now attempting to produce a large amount of our protein in CHO cells for further analysis. If we are successful, this protein will be a great tool for Wnt's many research fields and will enable applications in the regenerative medicine space.

408 1:00 pm N

Kinetic properties of heterodimeric IDH1

Elene Albekioni, Chemistry and Biochemistry (D)

Isocitrate dehydrogenase 1 (IDH1) is a cytosolic enzyme responsible for maintaining the redox environment and α-ketoglutarate (AKG) pools in cells. At physiological pH, IDH1 forms catalytically competent homodimers that readily convert isocitrate (ICT) to AKG in an NADP+ dependent oxidative decarboxylation reaction. AKG and NADPH are critical metabolites in cells as AKG represents a substrate for histone demethylases and the TET family hydroxylases and is used in the TCA cycle, while NADPH provides important reducing power for the cell. Mutations in IDH1 are associated with multiple tumor types, such as gliomas and glioblastomas, and usually affect active site residue R132, which takes part in coordinating the ICT substrate. IDH1 R132 mutations cause a gain of function and catalyze an NADP+ dependent neomorphic reaction that converts AKG to D-2-hydroxyglutarate (D2HG) that can competitively inhibit AKG-dependent enzymes. Previously published work showed that IDH1 is able to form wild type/mutant heterodimers where the wild type monomer has conserved its function to produce AKG and NADPH. Since the products of this normal reaction are used as substrates in the neomorphic reaction, we seek to understand the mechanism of substrate channeling and the equilibrium partitioning in WT/mutant heterodimer for more efficient conversion to D2HG. We hypothesize that IDH1 WT/mutant heterodimers will be more catalytically efficient at generating D2HG than mutant/mutant homodimers. We used spectroscopic tools to observe the rate of NADPH formation in the normal reaction and NADPH consumption in the neomorphic reaction, respectively, as NADPH has an absorbance maximum at 340 nm. We studied the kinetics of the two most interesting mutations of IDH1 R132H:WT and R132Q:WT heterodimers, by expressing and purifying WT and mutant enzymes independently, and then allowing dimerization to occur in solution. Since heterodimerization likely occurs in tumor cells, understanding how rates of the normal and neomorphic reactions compare in the IDH1 homodimer and heterodimer complexes allow us to better understand the molecular mechanisms of IDH1 catalysis in tumors.

409 1:00 pm O

Detection of nucleic acids using the CRISPR/Cas system and single-molecule imaging techniques

Stephanie Silva, Biochemistry (M)

Sensitive and specific diagnosis of diseases is necessary for effective identification and treatment; however accurate diagnosis remains a challenge. The CRISPR/Cas system is a nucleic acid-based adaptive immune system with enzymatic activity discovered in archaea and bacteria that protects them from viral infection. Due to their selectivity and programmability, CRISPR/Cas systems have been involved in the development of biosensors and biosensing systems for the detection of nucleic acids. In this study, we develop a single-molecule sensitive DNA assay based on Cas14a1 proteins. This is accomplished by tethering Cas14a1 proteins to membrane microarrays. The binding of a single target DNA can be detected by continuous endonuclease reactions that release a quencher from fluorescent reporter DNA strands. In this presentation, we will focus on the fabrication of membrane microarrays, optimization of surface chemistry, and validation of signaling amplification strategy.

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410 1:00 pm P

Exploring the mechanisms of IDH1 pH sensitivity

Nicole Sierra, Biochemistry (U)

Across the globe, cancer patients are significantly impacted by the proto-oncogene isocitrate dehydrogenase 1 (IDH1). While many cancers are driven by mutations in IDH1, resulting in the catalysis of a new reaction that has been shown to drive tumor formation, wild-type (WT) IDH1 has also been shown to drive many cancer types. WT IDH1 drives the oxidative decarboxylation reaction of isocitrate to alpha-ketoglutarate, with concomitant conversion of NADP+ to NADPH.
This reaction can support tumor growth by synthesizing alpha-ketoglutarate, which can serve as a precursor for fatty acids and other metabolites, while NADPH is required to regenerate antioxidant molecules. We know from previous structural informatics and pKa calculations that the residue D273 in IDH1 is sensitive to changes in pH, allowing IDH1 to serve as a pH sensor. By affecting the activity of pH sensors, cellular pH can regulate protein-protein and protein-ligand interactions, including the stability and activity of a protein. There are several ways for a shift in pH to occur in a cell; for instance, a decrease in pH may be caused by nutrient deprivation, immune processes, and oxidative stress. D273 is located in the first third of the α10 helix, an important regulatory domain. To determine the role of D273 in pH sensitivity, experimental mutants were designed (D273N, D273L, and D273S IDH1) to have minimal disruption in the overall structure but still destroy the ability of the residue to ionize. The mutants produced very drastic decreases in catalytic efficiency for the forward reaction as compared with WT IDH1. Here we describe the pH sensitivity of a new ionizable mutant, D273E IDH1. Using site-directed mutagenesis, the formation of the D273E mutant was made and the enzyme was heterogeneously expressed and purified. We predict that this mutant will retain pH sensitivity when measuring the rates of αKG production since it can change its ionization state. This work provides more information in discovering new mutations that can play a role in regulating human IDH1 catalysis.

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411 1:00 pm Q

Untargeted Lipidomics in U87-MG Glioma Cells

Grace Chao, Cell and Molecular Biology (D)

Isocitrate dehydrogenase 1 (IDH1) catalyzes the NADP+-dependent conversion of isocitrate to α-ketoglutarate (α-KG) in the cytosol and peroxisomes. This reaction yields the primary source of NADPH in peroxisomes, which are intracellular organelles found in virtually all eukaryotic cells. Peroxisomes are involved in α-oxidation of very long chain fatty acids, α-oxidation of phytanic acid, degradation of H2O2, and biosynthesis of ether lipids. Mutations in IDH1 drive a variety of cancers, most notably gliomas and glioblastoma, and lead to production of D-2-hydroxyglutarate, an oncometabolite, and also prevent its normal activity, leading to decreased α-KG and NADPH. Peroxisomes are a crucial organelle involved in lipid processing reactions which require NADPH. Because ether lipid biosynthesis is dependent on IDH1-derived NADPH, we hypothesize that cells expressing mutant IDH1 have dysregulated lipid levels due to NADPH deficiency. Using U87-MG glioma cells, we extracted lipids using the Bligh and Dyer liquid-liquid method with chloroform/methanol separation, and analyzed fractions using liquid chromatography with tandem mass spectrometry (LC-MS/MS). Samples from the separated phases were run on a C18 column for reverse phase separation or a hydrophilic interaction liquid chromatography (HILIC) column for normal phase separation, and then analyzed on the Bruker Impact II UHPLC-QTOF instrument. Data were converted to mzXML files and uploaded to two widely used metabolomic and lipidomic databases. We were able to identify known lipid standards using our optimized reagent system and detect differences among mutant and wild type IDH1. The optimized system will allow us to detect with high sensitivity the different levels of lipids between IDH1 mutant cells to predict new pathways affected by mutant IDH1-driven tumors.

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412 1:00 pm R

Using NMR Spectroscopy to Trace 15N-Isoptopes through an Engineered Food

Tuan Le, Biochemistry (M)

Egg-laying chickens in industrial egg production systems are typically fed pellets that contain a constant percentage of nutrients such as carbohydrates, proteins, and trace elements such as calcium. The pellets are monotonous in nutritional makeup and do not provide the natural variety of nutrients available to wild relatives of chickens (i.e., junglefowl; Gallus gallus). In addition, pellet ingredients are typically derived from plant-based grain sources obtained from industrial agriculture. It is anticipated that global warming will result in unpredictable climate change that may severely impact existing agricultural systems. We seek to develop an alternative protein source for egg-laying chickens by engineering a food chain that starts with cultured microorganisms (e.g., E. coli, yeast), which are fed to insects (e.g., mealworms, crickets, and black soldier fly larva (BSFL)), which are subsequently fed to egg-laying chickens. The idea is that by customizing the molecular makeup of the proteins within the microorganisms, and by feeding chickens live insects, we will ultimately improve both the health of the chickens as well as the nutritional quality of the eggs they produce. Another benefit of this type of system is that microorganisms and insects can be cultured much more rapidly than agricultural protein obtained from standard crops such as soy and corn. In addition, microorganisms and insects can be cultured within climate-controlled facilities, similar to wine and beer fermentation, and thus are as not as vulnerable to changing climates. To test this concept, we grew bacteria on minimal media that contains essential compounds such as nitrogen and phosphate salts similar to those found in plant fertilizers. To verify that these compounds were moving through the engineered food chain, we used a nitrogen source (ammonium sulfate) that was 95% enriched with the NMR active isotope 15N. The cultured bacteria were fed to BSFL, which were subsequently fed to egg-laying chickens. NMR spectroscopy was used to verify the presence of 15N within the cultured bacteria, the BSFL, and ultimately the eggs produced by the set of chickens that were fed 15N-labeled BSFL.

413 1:00 pm S

DNA Polymerase ε: An Investigation of an Exonuclease Mutation

Brittany Bermoy, Biochemistry (M)

DNA polymerases are enzymes that are responsible for synthesizing new strands of DNA in the replication of the genome. Human polymerase ε (POLE) replicates DNA from the leading strand with high accuracy due in part to its ability to proofread via exonuclease activity. Mutations within POLE have been found in many types of cancer, including uterine corpus endometrial carcinoma and glioblastoma, with mutations most commonly affecting the exonuclease domain between amino acids 86-426. The underlying kinetic consequences of these mutations are not yet fully understood. After introducing the exonuclease mutation V411L into POLE and heterologously expressing and purifying this enzyme, we can determine the mechanisms and subsequent effects on POLE function using pre-steady state kinetic approaches. We hypothesize that V411L POLE will have decreased rates of nucleotide incorporation, and decreased fidelity. This work allows us to analyze the rates of nucleotide incorporation and excision during DNA synthesis to better understand the consequences of this mutation in the tumor environment. Ultimately, we can elucidate the changes in the polymerase function resulting from this mutation, allowing us to understand how it might drive tumor formation.

Session H-4

Poster Biological and Agricultural Sciences 12
Friday, March 4, 2022, 1:00 pm
Location: Montezuma Hall

414 1:00 pm T

Evaluating Racial, Ethnic, and Gender Differences in Immune-Related Adverse Events in Patients Treated with Immune Checkpoint Inhibitors

Thomas Luu, Biology (U)

Introduction: Immune checkpoint inhibitors (ICIs) are immunotherapeutic treatments with the potential of durable remissions even in patients with metastatic disease. However, some patients treated with ICIs have experienced immune-related adverse events (irAEs) in various categories, including dermatologic, endocrine, and gastrointestinal toxicities. Currently, it is unknown whether demographic variables such as race, gender, or ethnicity are associated with the frequency and category of irAEs experienced. We hypothesize that demographic differences may be present because of variations in genetic and environmental factors, as well as social factors related to diagnosis and treatment.

Methods: We reviewed data from a total of 350 patients with stage III and IV cancers treated with ICIs at the UCSD Moores Cancer Center. The patients were divided into a control group that experienced no irAEs (n=227) and a population of interest with patients who experienced irAEs (n=123). We compared differences in the mean frequency of irAEs using t-tests and ANOVAs. We also explored the association between irAE category and demographic variables using Fisher's Exact test and chi-squared test.

Results: We found no significant differences or associations in mean frequency and type of irAE category across gender and ethnicity. However, racial comparisons found significant differences in the mean frequency of irAEs (F4,118= 2.534, p<0.05). Specifically, Asian patients treated with ICIs have an average of one more irAE than White or Black/African American patients. Significant associations were also found between irAE and treatment type, X2 (28, N = 156) = 57.50, p <.001. Notably, treatment with anti-PD-L1 is associated with an increased prevalence of fevers across all demographic groups.

Conclusions/Implications: Our findings indicate that there may be racial differences in the mean frequency of irAEs in patients treated with ICIs. In addition, our results suggest that there is an association between certain treatment types and categories of irAE across all patient demographics. However, our conclusions are limited by the small sample size. These differences may negatively affect treatment adherence and outcomes. Therefore, future research should broaden the dataset to increase generalizability and learn more about differences in the development of irAEs.

415 1:00 pm U

Dynamic transcriptional changes in the adult Drosophila central nervous system highlights potential coordination of stress and repair responses following traumatic brain injury

Eddie Cho, Bioinformatics and Medical Informatics (M)

Traumatic brain injury (TBI) from accidents, domestic violence, sports and combat are a major cause of worldwide mortality and disability. Several groups have shown that adult Drosophila can be an effective model to examine the physiological, behavioral, neuronal, and molecular responses following TBI exposure. In this study, we have continued our Drosophila TBI research using RNA-sequencing to examine dynamic acute and long-term changes to central nervous system (CNS) gene expression profiles in adult flies following severe (sTBI) and mild repetitive TBI (mTBI) exposure. Principal component analysis (PCA) highlight highly dynamic transcriptional changes in male and female flies, with over a third of the Drosophila transcriptome showing 1.5-fold (+/-) alterations 4-hrs post-TBI. By 24-hrs, both genders rapidly shifted toward baseline transcriptome levels. 4-days post TBI male fly cohorts maintained a more baseline transcriptome profiles, while female flies had a second round of gene expression changes. Transcriptional changes trend toward baseline levels at 7-days post. Genes with significant alterations were analyzed using DAVID to identify functional gene-pathway clusters. At 4-hrs both genders had significant changes to NFKB and IMD pathway components, indicating rapid activation of stress and inflammatory signaling. At this time dramatic changes to neuronal/ERAD stress responses, ribosomal, vesical trafficking, and membrane transport components also occurred. At 24-hrs, inflammation remains elevated, along with alterations to cytoskeletal, kinase-phosphatase and proteolytic pathway members. At 4-days, there is a significant increase in select metallopeptidases as well as changes to organelle, protein and basement membrane modifying processes. 7-days post-TBI, DAVID revealed changes to alternative splicing factors, ER, cytochrome P450, glutathione metabolism, and members of the scavenger receptor pathways. Cell cycle components demonstrated multiplex differences, with PCNA and several cyclin genes increased significantly (4-hrs). Our novel trauma injury paradigm illustrates the effectiveness of model systems to identify conserved genetic factors influencing the complex stress and repair mechanisms underscoring in vivo trauma exposure. The goal of these findings is to identify genetic factors that are linked to adverse acute or protracted TBI outcomes and in the discovery of novel therapies for those experiencing trauma.

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416 1:00 pm V

Short-Term Exercise Blunts Vaping Induced Pulmonary Injury

Pria Bose, Cellular and Molecular Biology (U)

The benefits of exercise are well documented and the pulmonary damage of vaping is an emerging field, yet the link between exercise and vaping has not been investigated directly. This study tested if short-term exercise blunts vaping-induced pulmonary injury. The mice were separated into groups based on vaping treatment, exercise treatment, and gender. The groups include vaped and non-vaped males each with and without exercise, as well as vaped and non-vaped females each with and without exercise. Exercise is defined as nightly access to a running wheel with revolutions recorded. After 9 weeks of vape-exposure with and without exercise, the lungs were analyzed by quantitative microscopy. The weekly average distance ran in the vaped with exercise group was significantly decreased than the exercise control group; the average distance ran by a female vaped and exercise mouse was 5.531 miles compared to 14.810 miles for the female controls (P value 0.0009) and the average distance ran by a male vaped and exercise mouse was 2.677 miles compared to the 8.932 miles for the male controls (P value 0.0009) There were also significant differences in mean linear intercept (MLI), a measure of airspace size, among the males. The mice who ran and vaped had an average free distance of 0.294 micrometers between alveolar walls compared to the distance of 0.679 micrometers in the vaped controls, a significant difference in increased free space in the alveoli (P value 0.0079). Moreover, the MLI for the baseline controls and the running controls was 0.201 micrometers and 0.217 micrometers respectively, neither significant compared to the MLI of the vaped mice with exercise. This demonstrates that the exercise treatment prevented the alveolar destruction present in the vaped without exercise treatment. The MLI in the females was not significant between the vaped with exercise and the vaped without exercise with an MLI of 0.340 micrometers and 0.417 micrometers respectively (P value 0.758). More research must be done to assess gender differences in vaping-induced pathology and the longevity of protection offered by exercise, but this study introduces the potential for exercise to blunt pulmonary e-cigarette damage.

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417 1:00 pm W

TWEAK/Fn14 Axis Promotes a Stem-like Phenotype Contributing to Ovarian Cancer Relapse

Ryne Holmberg, Biochemistry (D)

Ovarian cancer is the deadliest gynecological cancer with over 13,000 deaths in the US this year. Ovarian cancer patients typically respond well to traditional chemotherapy; however, most patients relapse within two years. This is likely due to a small population of stem-like tumor-initiating cells (TICs) which survive treatment and create new heterogeneous tumors. Our previous work has shown that the TIC phenotype is supported by alternative NF-αB signaling and that TWEAK cytokine, a strong inducer of alternative NF-αB signaling, is increased threefold in mouse ovarian tumors following three cycles of chemotherapy treatment relative to mice receiving vehicle. Moreover, the tumors showed a corresponding increase in nuclear localization of alternative NF-kB transcription factor, RelB. Therefore, we hypothesized that TWEAK secretion is enhanced following chemotherapy and may be contributing to TIC development through alternative NF-αB signaling. We characterized the effects of TWEAK on development of TIC features such as spheroid formation and stem cell transcription factor expression in ovarian cancer cells. TWEAK stimulation promotes the expression of the stemness marker SOX2 and confers an increased spheroid formation ability. Additionally, CD117+ TICs stimulated with TWEAK had increased expression of stemness genes relative to similarly treated CD117- cells. This suggests that TWEAK has activity specific to TICs which may enhance their stem-like phenotype. We also found that CD117+ cells had higher expression of the TWEAK receptor Fn14, further supporting a specific role for TWEAK in TICs. To further investigate the role of TWEAK in supporting relapse in vivo, we used an intraperitoneal xenograft mouse model and found that inhibition of TWEAK/Fn14 with a small molecule following chemotherapy significantly prolonged survival. This study has uncovered a novel mechanism for inducing a TIC phenotype and indicates that therapeutically targeting the TWEAK cytokine after chemotherapy may prolong remission or prevent relapse in ovarian cancer patients.

418 1:00 pm X

Optimizing derivation of decidual-type natural killer cells (dNK) from induced pluripotent stem cells (iPSC)

Carly DaCosta, Interdisciplinary Studies (U)

Abnormal frequencies of decidual natural killer (dNK) cell populations have been found within human gestational syndromes such as preeclampsia and preterm birth. The Parast lab has recently been funded to establish induced pluripotent stem cell lines, from term and preterm pregnancies, to model interactions between matched maternal cells and placental cells (trophoblasts). Specifically, we plan to model interactions between trophoblasts and dNK cells.

A human embryonic stem cell (hESC) line will be set up into spin embryoid body (EB) cultures and differentiated into hematopoietic progenitors. Then, EBs will be transferred into media for differentiation into natural killer (NK) cells. Differentiation will be assessed by flow cytometry at each step. RNA will be isolated from these cells and will be assessed by quantitative polymerase chain reaction (qPCR) for the specific differentiation markers. Subsequently, we will design various changes to this protocol for differentiation of the hESC line into dNK-like cells. We will also apply various alterations to the above culture conditions, including the addition of specific growth factors (such as IL-15), trophoblast-derived factors (such as galectin-9), as well as culture in hypoxia (2-5% oxygen), to optimize hESC differentiation into dNK-like cells. More specifically, we will attempt to replicate the phenotype of primary dNK cells, as observed in the placenta, based on CD9 and CD103 expression, in the hESC-derived dNK. Next, we will also try optimizing dNK differentiation through hESC-derived NK co-culture with primary human trophoblast stem cells (hTSC) and hTSC differentiated into HLA-G+ extravillous trophoblast (EVT), the placental cell type that most closely interacts with dNK cells at the maternal-fetal interface.

Analysis of successful differentiation from NK to dNK will use the same techniques – flow cytometry and qPCR.

419 1:00 pm Y

Establishing the Role of the Conserved TN Domain in Tinman

Cayleen Bileckyj, Cell and Molecular Biology Joint Doctoral Program (D)

Congenital heart disease (CHD) is a major factor in mortality and morbidity in children and adults. Even though there has been substantial progress in detection and treatment, not all congenital heart defects can be identified early on through physical screenings. To advance our abilities to identify and manage CHD, we need to further understand the key genetic factors involved in causing these maladies. Since Drosophila melanogaster shares similar cardiac developmental mechanisms with humans, it has been an essential model for human heart development. One similarity occurs between Tinman (Tin), a transcription factor in Drosophila necessary for the differentiation of cardiac cells, and its mammalian ortholog NK2 Homeobox 5 (Nkx2.5). These proteins share two conserved regions: the homeobox domain and the tin (TN) domain. Although the TN domain is completely conserved between these two proteins, there is little known about its significance. By utilizing CRISPR/Cas9 gene editing, I established a line of Drosophila containing an in-frame deletion of the TN domain. Staining Drosophila embryos for NMR, a marker of cardial cells, revealed mutant embryos generate a significantly higher number of cardial cells when compared to wild type embryos ($p<0.01$). I also stained embryos for Tin and Svp, a protein important for heart development in Drosophila, to determine if the deletion of the TN domain affected cardial cell specification. Mutant embryos contained more cells expressing tin and more cells expressing svp than wild type embryos. These results support the importance of the TN domain in heart development and indicate the increase in cardial cells occurs before cardial cells differentiate into cells exclusively expressing tin or svp. Tin and Nkx2.5 are vital to proper heart development. Characterizing the role of the conserved TN domain in these transcription factors provides the opportunity to vastly improve our understanding of the mechanisms involved in cardiac formation and maturation.

420 1:00 pm Z

The Role of IGFBP5 in Ovarian Cancer

Ixchel Urbano, Biology, Cellular and Molecular Biology Emphasis (U)

Ovarian cancer is the most lethal cancer in women. Factors like obesity lead to decreased patient survival, however a root cause for increased morbidity remains elusive. Adipocytes are fat cells that interact with cancer cells in the tumor microenvironment. Adipose tissue is the most prevalent metastatic site for ovarian cancer cells. During metastasis adipocytes de-differentiate into pre-adipocytes that have a stem-like phenotype, but it is not known how de-differentiated cells support cancer progression. Insulin-like growth factor binding protein 5 (IGFBP5) is a gene that is up-regulated when cancer cells are co-cultured with preadipocytes; IGFBP5 has also been shown to decrease patient survival in clinical databases. Research I participated in explored whether IGFBP5 is pro- or anti-tumorigenic and aims to analyze how preadipocytes interact with cancer cells to promote ovarian cancer progression. The CRISPR Cas9 system was used to knock out IGFBP5 from the genome of several cell lines. IGFBP5 knockout was confirmed via western blotting to identify cell lines that no longer expressed IGFBP5. Following western blot analysis, cell lines confirmed to be negative for IGFBP5 were sent for sequencing to confirm successful, on-target CRISPR editing. Knockout cell lines were then selected for an in vivo study by comparing their morphology and growth rates to their parental cell lines. Earlier mouse models showed that preadipocytes support tumor formation in addition to upregulating IGFBP5 in vitro, suggesting that IGFBP5 could be involved in supporting tumor initiation. In the ongoing study, either wild-type or IGFBP5 knockout ACI-23 cells with and without preadipocytes were injected subcutaneously into immunocompromised mice to analyze the effect of IGFBP5 knockout on ovarian cancer progression. Each mouse received a vehicle injection on the right flank and a second experimental injection with one of the previously described cell combinations on the left flank. Preliminary data is showing that IGFBP5 knockout decreases preadipocyte stimulated tumor initiation and growth. Tumors are being collected and analyzed from mice that have reached a specified tumor size. Data from this experiment will be especially useful in determining how preadipocytes modulate IGFBP5 in cancer cells and how this mechanism supports ovarian cancer progression.

Session H-5

Poster Engineering and Computer Science 7
Friday, March 4, 2022, 1:00 pm
Location: Montezuma Hall

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421 1:00 pm AA

Manufacture of Glassy Carbon Transistor (GCT) for Increased Sensitivity of Neural Activity/μECOG Signals

David Trejo-Rodriguez, Masters of Science Bioengineering (M)

Brain computer interfaces (BCIs) rely on capture of chemical and neural activity which can be heavily localized with signal levels ranging as low as millivolts. Material selection presents a challenge as materials used require unique electrical properties and a high degree of biocompatibility. Gold and platinum have been the standard for use at the tissue-electrode interface, however the need to create smaller devices has led to the performance limitation mainly in regards to signal sensitivity due to background noise.

Graphene based devices have been proposed to overcome these challenges, possessing the necessary biocompatibility, mechanical, and electrical properties. A previously reported device consisting of a Graphene Transistor array has shown promise in achieving highly sensitive recordings of μECOG activity. Graphene is not without its challenges predominantly in its manufacturability, quality yield, operational control due to a lack of electrical band gap, and high cost. Glassy Carbon has emerged as an alternative material with comparable performance to graphene and can be easily implemented in the manufacturing process and at a lower cost.

This project aims at describing the operational theory and design & development of a flexible μECOG probe with a Glassy Carbon Transistor (GCT) array for the capture of local neural activity using MEMs based manufacturing methods to compare to a similar Graphene based device. Design parameters to be investigated will include transistor size, channel density, and array geometry. Proposed production will be done using a silicon wafer, SU-8 photoresist deposited and patterned to define the array geometry and converted to Glassy Carbon using a pyrolysis process. Insulation layers consisting of Polyimide, patterned for structural support, with an intermediate metal layer, serving as metal traces to connect the GCT array to external electronics, by patterning futurrex photoresist followed by a metal deposition and metal liftoff processes.

Expected results should show performance above traditional metal based solutions and comparable performance to graphene. Market and cost analysis exploring the financial opportunity and commercial viability are expected to show a value proposition orders of magnitude above other solutions. Overall results should show Glassy Carbon's potential to meet current and evolving needs of BCI's.

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422 1:00 pm BB

Advancements in the Visualization of Auditory Stimulus in Songbirds Using Novel Epicortical and Intracortical Neural Probes

Matthew Dacayo, Mechanical Engineering emphasis in Bioengineering (U)

In Starling birds, when an auditory stimulus is played, it causes a response on the surface of the brain, as well as in the depths of the brain matter with varying intensities. This neural response can be measured through an Epi-Intra neural probe with glassy carbon microelectrodes. These electrodes measure neural activity, which can then be converted into figures using machine learning algorithms.

The premise of this project is to make the visualization of the neural activity data easier to digest for the audience for the purpose of presentations. Using MATLAB, a general user interface was created to help animate the data obtained from the neural activity of the Starling birds. Using the animation, it is possible to describe the association in the varying connectivity intensity, with the corresponding intensity of the auditory stimulus. Many different versions of the animation were considered, prioritizing audience comprehension. The most effective forms of animation found were displaying the calculated figures while the auditory stimulus is playing and showing the part of the brain the neural activity was originating from in correlation with the auditory stimulus.

In the future, different time-lapses are planned to be made in order to further improve audience comprehension. This project will help improve the efficiency of knowledge exchange through easier visualization of data that was once considered difficult to understand and visualize.

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423 1:00 pm CC

Effect of LVAD outflow graft diameter on flow pulsatility in the aortic arch

Britton Mennie, Mechanical Engineering - Emphasis in Bioengineering (U)

Left ventricular assist devices (LVADs) are implantable pumps that are placed in patients with advanced heart failure who are unable to receive a heart transplant. Miniaturization of device components for ease of surgery may negatively impact clinical outcomes such as stroke by restricting flow and increasing shear. This study aims to evaluate the impact of reducing LVAD outflow graft diameter (OGD) on flow in the aortic arch using a benchtop experimental simulator. This study was conducted with a circulatory mock loop containing a glass aorta, silicone model of the left ventricle, a HeartMate 3 LVAD and Tygon tubing. Three OGD sizes were used: 10mm, 12.7mm, and 16mm; LVAD speed was set at 4.4krpm and 5.4krpm. Flow and pressure sensors were used to obtain data that was then processed through LabChart software which analyzed the flow and pressure rates. DaVis software allowed us to isolate regions of interest (ROI) to find average velocity within the brachiocephalic (B), carotid (C) and subclavian (S) branches of the aorta. The regions of interest measured the velocity in each branch for each of the 6 conditions.At the 5.4krpm LVAD speed with the largest OGD, total LVAD flow was 5.03 L/min with 24% (1.1L/min) entering the aortic arch branches and 76% (3.71L/min) continuing downstream. ROI measurements found velocities of 0.16(B), 0.17(C) and 0.14(S) m/s. When OGD was decreased to 10mm, branch vessel velocities increased to 0.21(B), 0.33(C) and 0.34(S) m/s respectively. These findings indicate that the distribution of flow through the vessels that branch from the aortic arch is affected by OGD, such that an increase in OGD affects B flow preferentially. Further investigation of flow pulsatility is planned.

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424 1:00 pm DD

Effects of Pulsatility and Outflow Graft Diameter on Aortic Arch Flow with a LVAD

Aubrey Benjamin, Mechanical Engineering with emphasis in Bioengineering (U)

Left ventricular assist devices (LVADs) are mechanical pumps attached to the native heart and aorta to treat patients with heart failure. Surgeons have requested a reduction in outflow graft diameter (OGD) for ease of implantation, but there are concerns about changing the underlying flow dynamics. The aim of this project was to measure the flow through a transparent model of the human aortic arch with a HeartMate3 LVAD and evaluate the flow interaction with the native heart for a range of OGD. A model of the human cardiovascular system was assembled using a glass aorta with three branches representing the brachiocephalic (B), carotid (C) and subclavian (S) arteries. The aorta was attached to a silicone left ventricle (LV) with a HeartMate3 LVAD connecting the LV apex to the ascending aorta. A mechanical piston system was built to compress the silicone LV and generate native heart pulsatility. The system consists of a air cylinder connected to a 3-way solenoid valve controlled by an Arduino board.. The HeartMate3 outflow graft was attached to the ascending aorta with Tygon tubing and three different OGD (10,13, 16 mm) were tested. The piston compressed the LV at 60 beats per minute while LVAD speeds of 3.9,4.4,4.8 and 5.4krpm were evaluated. Pressure in the LV and aorta, and flow in the LVAD, arch branches and downstream aorta were measured with sensors for a total of 12 conditions. For 13 mm OGD the LVAD flow increased from 3.4-4.7L/min over the range of LVAD speeds; 34% entered the arch branches and the remainder flowed through the descending aorta. When OGD was decreased, LVAD flow decreased to 3.2-4.5L/min with 36% through the branches. When OGD was increased, LVAD flow increased to 3.7-5.1L/min with 32% branch flow. From the smallest to largest OGD, LVAD flow increased by 13%, aortic flow by 18% but branch flow remained constant. Over this same range, the distribution of flow shifted from 36%B/34%C/30%S at the lowest OGD to 34%B/34%C/32%S at the highest. These findings demonstrate that smaller OGD mildly reduces LVAD flow with minimal impact on the distribution of flow to the arch branches.

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425 1:00 pm EE

Studying the diagnostic value of CT images in COPD through convolutional neural networks

Amanda Lee, Computational Science (D)

Chronic obstructive pulmonary disease (COPD) is the third leading cause of disease-related death in the United States. Recent studies have shown lung structure, quantitatively measured using lung computed tomography (CT), can supplement COPD severity staging. However, imaging protocols used in these studies require two lung CT acquisitions, one at full inspiration and one at normal expiration, which is not the clinical standard and further increases patients' exposure to ionizing radiation. We hypothesize that inspiratory images alone, collected during patients' routine care, contain the majority of information necessary for imaging-based COPD diagnosis. Convolutional neural networks (CNNs), a subset of image-based deep learning algorithms, have become rapidly popular in radiology due to their ability to automate complex predictive tasks. We propose using a CNN to stage COPD severity using a patient's inspiratory image as input. This retrospective study is HIPAA-compliant and IRB-approved with a waived requirement for written informed consent. We sampled 9,115 inspiratory/expiratory lung CT image series, along with their spirometry-based GOLD stages according to the Global Initiative for Obstructive Lung Disease guidelines, from the COPDGene Phase I cohort. Inspiratory and expiratory images were first resized to 192x192x192 resolution and scaled by 1/3000 prior. A 3D residual attention network was then developed to predict GOLD stage using only preprocessed inspiratory images as input, and with a 7500/615/1000 training/validation/testing split. The proposed method is evaluated based on its ability to accurately predict COPD stage. The model developed in this study lays the foundation for a comparative analysis to study the degree of added benefit through the inclusion of expiratory images. Determining which CT images are necessary for diagnostic evaluation may reduce costs to both patients and institutions.

This work is supported by a scholarship award funded by the National Science Foundation grant DUE- 1930546.

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426 1:00 pm FF

Hospital Classification Analysis

Joseline Ayala, Big Data Analytics (M)

Open source medical data allows researchers from all domains to apply various analyses to better understand health factors ranging from risks, prevention, and prediction. The MIMIC database is one example of this resource as it contains "health-related data associated with over 40,000 patients" who stayed in critical care units of the Beth Israel Deaconess Medical Center between 2001 and 2019 (https://mimic.mit.edu/). The dataset is made available by researchers at the MIT Laboratory for Computational Physiology and collaborating research groups. Questions regarding hospital capacity requirements, severity of medical condition, and overall sentiment of the care provided are some of the topics that data science can provide support for. In our previous project, we used machine learning methods to identify and classify risk factors related to emergency department triage based on patient acuity levels and other indicators such as temperature, heart rate, respiratory rate, oxygen saturation, and pain levels. Analysis such as logistic regression and decision trees were used to classify severity of the patient's vital sign triage. This study aims to build on the previous project, and further consider predictors for length of stay in the emergency department or transfers to other care units, as well as text analysis of physician notes to improve patient care and reduce chances of readmission.

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427 1:00 pm GG

Fall Prediction and Detection in At-Risk Older Adults through Inferencing at the Edge

Jingxiao Tian, Electrical & Computer Engineering (D)

This study aims to develop a fall detection device that uses machine learning models to predict and detect falls. Subjects will perform walking and falling exercises in a controlled laboratory environment to generate inertial measurements captured by MEMS accelerometer and gyroscope sensors. These measurements will be used as features to train machine learning models. This study poses minimal risk to participants as participants are required to wear protective equipment on their bodies and will fall onto a padded surface.

Session H-6

Poster Physical and Mathematical Sciences 5

Friday, March 4, 2022, 1:00 pm

Location: Montezuma Hall

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428 1:00 pm HH

Large-scale synthesis of a fluorescent probe for specific DNA and RNA sequences

Esteban Mora, Biochemistry (U)

Invented in the Purse Lab, 8-diethylamino-tC (DEAtC) is a fluorescent cytosine analog that exhibits up to a 20-fold increase in fluorescent quantum yield when in duplex DNA as compared to the free nucleoside. This fluorescence increase is specific to matched base pairing and accordingly has potential applications for identifying specific target DNA and RNA sequences in biological samples. However, current methods used to synthesize DEAtC produce low overall yields, and a major bottleneck step prevents the product from being widely available for research use. Therefore, it is essential to improve the synthesis of DEAtC by identifying reaction conditions that are more robust and higher yielding. The major bottleneck step identified is the conversion of 2-[(2-amino-4-diethylaminophenyl)disulfanyl]-5-diethylaminoaniline to 5-[(2-amino-4-diethylaminophenyl)sulfanyl]pyrimidine-2,4(1H,3H)-dione. From a systematic study of reaction conditions, we have found that the greatest yields result from using N-methylpyrrolidone (NMP) as the solvent and 4 equivalents of trimethylphosphine (1.02 mL) and water (20mL), and the lowest yield when using diglyme as the solvent and 1 equivalent of trimethylphosphine (0.256mL) and water (5mL). From these experiments, it was determined that using NMP as the solvent and adding excess trimethylphosphine and water improved the yield of the desired product. With an improved synthetic method in hand, future work will focus on the applications of this compound in DNA/RNA sequence detection and in studies of the structure and dynamics of nucleic acids.

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429 1:00 pm II

Total Synthesis of Palmyramide A

Jessica Lang, Chemistry - Emphasis in Biology (U)

The American Cancer Society points to lung cancer as the second most common form of cancer in men and women and the number one cause of cancer deaths in the United States. For decades now, chemotherapy has stood as the major method of treatment - costly, invasive, with success rates that are fairly low. As lung cancer continues to threaten human life, it is of major interest to expand the options and methods of treatment. Palmyramide A is a cyclic depsipeptide composed of three amino acids and three hydroxy acids, which was discovered to induce sodium channel blocking and cytotoxicity against cancer cells with an IC 50 of 17 µM. It also showed modest cytotoxic effects against H-460 human lung carcinoma cells, with an IC 50 of 39.7 µM. Due to these findings, it stands as a promising candidate for the development of new cancer drugs. Isolated from the cyanobacteria Lyngbya majuscula which resides near the Palmyra Atoll (Northern Pacific Ocean), Palmyramide A's natural availability is extremely scarce.
As such, we are proposing the first highly convergent total synthesis of this compound, in hopes that its mass production will provide sufficient material for further testing of the compound's effects against the disease, as well as its behavior among healthy cells.

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430 1:00 pm JJ

Modeling Protein-Protein Interactions Between Mitochondrial Malate Dehydrogenase and Citrate Synthase

Analisa Ballesteros, Chemistry-Emphasis in Biochemistry (U)

Mitochondrial malate dehydrogenase (MDH2) forms a protein-protein complex or metabolon in the tricarboxylic acid (TCA) cycle with citrate synthase (CS). MDH2 catalyzes the oxidation of malate into oxaloacetate which is subsequently channeled directly into the active site of CS without diffusion into the mitochondrial matrix. CS catalyzes the condensation reaction with acetyl-CoA forming citrate, effectively restarting the TCA cycle. The stability of this complex is modulated by the reactants and products and is thought to be important in the regulation of the TCA cycle. Here, we perform protein-protein docking studies using x-ray structures and molecular models of MDH2 and CS dimers with and without bound cofactors and substrates. Through these modeling studies, we hope to gain insights into the regulatory mechanism of this TCA metabolon.

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431 1:00 pm KK

Total Synthesis of Carmophycin X: A Potent Anti-Cancer Drug

Danielle Johnson, Chemistry (U)

Carmophycin X is a cyanobacteria derivative similar to Camrophycin A and Carmophycin B. Carmophycins have been tested against cancer cells and were found to be active against liver and lung cancer. Carmophycin X (3) in particular was found to be active against the liver cancer cell line (HepG2) with an IC50 < 62 picomolar (7,8) However it did have significantly reduced activity against lung cancer and colon cancer compared to Carmophycin A and Carmophycin B(4). The bigger difference between Carmophycin X and Carmphycin A and B are the substituents attached to the main chain. Carmophycin X had a pyridine, an alkyl group, and a phenol which we do not see in Carmophycin A or B. Our plan is to find a way to synthesize Carmophycin X in fewer steps that were previously known without losing any of its reactivity. In our lab, we decided to take the molecule and do a convergent synthesis resulting in a 10 step process resulting in Carmophycin X.

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432 1:00 pm LL

Preparation of Functionalized Potassium Alkenyl Trifluoroborate Compounds via Hydroboration of Terminal Alkynes

Stephanie Pinedo, Chemistry (M)

Organotrifluoroborates are successful substrates used in organic synthesis due to their reactivity and stability. In this research, a synthetic route to prepare functionalized potassium alkenyl trifluoroborates is presented. Terminal alkynes with functional groups are hydroborated without the reduction of functional groups. The functionalized alkyl vinyl borane is converted into the vinyl boronic ester derivative via two group migration reductive alkylation. The vinyl boronic ester derivative is then isolated as the functionalized potassium alkenyl trifluoroborate product. This research demonstrates successful hydroboration of different terminal alkynes with functional groups without the need of protecting groups including carbonyls, nitriles, some amines, and aryl groups. Other functionalized terminal alkynes requiring protecting groups such as alcohols have also been successfully hydroborated and converted into the isolated potassium alkenyl trifluoroborate product. Potassium alkenyl trifluoroborates can be useful in many applications such as Cross-Coupling. More specifically, they can be used to form sp2-sp2 carbon bonds in Suzuki Cross-Coupling reactions. Functionalized alkenyl trifluoroborates can facilitate the production of small molecules used in synthetic chemistry more importantly in medicinal chemistry and drug discovery.

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433 1:00 pm MM

Potential Benefits of Azetidine- Substituted Fluorescent Nucleobase Analogues

Christina Rivera, Biochemistry (U)

Fluorescent Nucleobase Analogues (FBA) have displayed important potential capabilities to probe the structure and dynamics of DNA and RNA. The ability to tune their brightness, emission wavelength, and photostability while minimizing perturbation of the biomolecules has also proven to be a great boon in single molecule studies. Prior studies in the lab have developed a new tricyclic pyrimidine nucleoside analogue exhibiting brightness greater than any other FBA in presence of oligonucleotides in single stranded and duplex sequences. The C-linked 8-(diethylamino)benzo[b][1,8]naphthyridin-2(1H)-one nucleoside (ABN) is also the most red-shifted fluorescent nucleobase analogue in duplex DNA, introducing a new opportunity for effective single-molecule fluorescent detection. As seen in Janelia Fluor Dyes, replacing a N,N-dimethylamino in a fluorophore with azetidine can significantly improve quantum yield and photostability. This subtle modification can result in a molecule with an increased fluorescent lifetime and a capability to withstand additional synthetic modification, while preserving extinction and emission profiles. I hypothesize that adding an azetidine ring to ABN in place of the N,N-diethylamino group, similar to the Janelia Fluor Dyes, would also result in improvements in quantum yield and photostability. This new fluorescent nucleobase analogue would be beneficial since its improved brightness, red-shift, and photostability would make a more effective labeling, imaging, and detection system for DNA/RNA structure and dynamics.

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434 1:00 pm NN

Evaluating the detection of fluorescently labeled amino acids in deep eutectic solvents

Karen Campos, Chemistry (U)

Deep eutectic solvents (DES) are non-aqueous liquids composed of a Brønsted or Lewis acid and base, with strong hydrogen bonds with unique properties. Usually, two powders are combined to form a mixture that becomes liquid at room temperature. DES's are novel solvents that can dissolve organic materials and are a useful tool for the extraction of natural compounds. In contrast to aqueous or organic solvents, DES's hydrogen-bonded system offers an environment where molecules retain their function and stability. For example, the careful extraction of proteins becomes possible in DES. In analytical chemistry, DES's have great potential as extractors, separation mediums, and more. The full range of applications of DES in capillary electrophoresis (CE) has yet been uncovered.

This poster will present our evaluation of the effectiveness of the labelling of amino acids by fluorescein isothiocyanate (FITC) in a DES. Amino acids (AA) are the building blocks of life and their separation and detection have been a focus of bioanalytical chemistry for decades. Very sensitive analysis of AAs can be achieved using CE coupled to laser-induced fluorescence (LIF), wherein the AA is labeled with a fluorescent dye like FITC. The separation of fluorescent amino acids from the dye itself, through CE-LIF indicates that there is fluorescent labelling performed and capable in DES. The reaction labelling will be optimized to ensure the effectiveness of the reaction, in specific we are examining the influence of temperature on the reaction yield. The quantification of the labelled AA will be performed by observing the peak areas of each separation. We will also explore the limits of detection for this reaction by evaluating decreasing concentrations of an AA in the reaction mixture. This data will be useful not only in our future research projects but also in the fields of biology, astronomy, and more.

Session H-7

Poster Health Nutrition and Clinical Sciences 5

Friday, March 4, 2022, 1:00 pm

Location: Montezuma Hall

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435 1:00 pm OO

Accuracy of a Predictive Core Body Temperature Formula During Exercise in Heat Stress in Healthy Adults

Robert Castro, Exercise Physiology & Nutritional Science (M)

Exercising in the heat is very common, yet can pose significant health risks, such as heat exhaustion and eventual heat stroke if core temperature exceeds 38°C, one degree above normal body temperature. Common methods to obtain the measurement are invasive, uncomfortable, and impractical in most situations. Therefore, alternative methods for monitoring core temperature during exercise are needed. Researchers have published a non-invasive method of obtaining core temperature via a predictive equation requiring only two inputs—scapular skin temperature and heart rate. The objective of this study was the assess the validity and reliability of this equation against the direct measure of core temperature.

Participants cycled in an environmental chamber (40°C, 40% humidity) at 75% of maximal heart rate (HR) for 45-minutes followed by a 5-minute cooldown period. Measurements included HR, scapular skin and core temperature, blood pressure, and rating of perceived exertion. Exercise stopped if core temperature exceeded 38.5°C for two consecutive measurements or volitional fatigue. Statistical analysis included a linear regression model to determine the association between the direct core measurement and predicted core temperature, and a Bland-Altman analysis to assess agreement of the two methods.

Results of the linear regression model indicated a low correlation ($R2 = 0.3$) between the direct measure and predicted core temperatures. The Bland-Altman analysis had a weighted bias of -0.04 and limits of agreement ranging from 1.14 to -1.21, with 43% of the total scores having a difference ± 0.3°C. Additionally, the predictive equation overpredicted as mean temperature decreased and underpredicted as mean temperature increased.

Based on the collected data and the narrow temperature range the body must stay within to prevent heat exhaustion, we've concluded that the predictive equation lacks validity.

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436 1:00 pm PP

Effects of Exercise Intensity on Cardiometabolic Health in Individuals with Spinal Cord Injuries (SCI): a Systematic Review

Jacqueline Erdkamp, Kinesiology Pre-Physical Therapy (U)

Background and Objectives: Exercise guidelines are well-established for people with spinal cord injuries (SCI). However, the effects of specific exercise intensities on cardiorespiratory health have not been compared. Thus, the purpose of this systematic review was to conduct a meta-analysis of randomized controlled trials (RCTs) and randomized crossover studies that compared changes in peak oxygen uptake (VO2peak) in people with SCI in high-intensity exercise versus low- or moderate-intensity exercise.

Methods: PubMed, CINAHL, Scopus, and SPORTDiscus were searched in October 2020 using the PICO model. Included studies were English-language RCTs or randomized crossover studies that directly compared the effects of high versus low- or moderate-intensity exercise on VO2peak in people with SCI. Quality of the studies was assessed by two independent researchers (T.Y. and J.E) using the Downs and Black assessment. The overall quality of evidence and risk of bias was assessed using Grading of Recommendations, Assessment, Development and Evaluations (GRADE). Meta-analysis was completed using a fixed-effects model and Hedges' g.

Results: Using the electronic databases, the search resulted in 911 articles. After screening, five studies met the inclusion criteria, and 69 participants (≥17 years old with SCI) were included. The standardized mean difference in VO2peak was 0.01 with a 95% confidence interval (CI), -0.43 - 0.45, favoring high-intensity exercise.

Discussion: Due to a serious risk of imprecision, there is moderate quality of evidence suggesting that the effects of the two intervention groups are similar. There was a negligible difference in the improvement of peak oxygen uptake. Further research is suggested given the limitations of these trials. No financial assistance was received in support of the study.

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437 1:00 pm QQ

Impacts of Almonds on Physical Activity

Maricarmen Cervantes, Public Health (U)

Almonds are rich in nutrients that may promote a more active lifestyle. This research aims to determine if almond consumption improves physical activity and recovery after vigorous exercise as well as other physiological outcomes over a more typical snack (pretzels). The goal of this cross-over study was to recruit 30 participants 18-45 years of age (15 men and 15 women) who were assigned to complete two 8-week trials (300 kcal/d almonds vs. unsalted pretzels) in random order with 4 weeks between trials. Lab visits occurred after abstaining from exercise for 24+ hours and after fasting for 10+ hours. Testing included VO2max test, vertical jump, strength, dexa for body composition, blood draw, anthropometric measurements, Profile of Mood States (POMS), muscle pain, food intake, and cravings questionnaire before running downhill on a treadmill at a 10% grade for 30 min. Recovery was tested for the next 3 days. During each trial, participants wore Actigraph monitors for at least 4 random days to measure their daily activity. Full data have not been analyzed; however, to evaluate the potential impact of the intervention on overall physical activity, we assessed the preliminary data from the Actigraph monitor using repeated measures ANOVA to compare the means for wear time per day, activity kcal per day, average steps per day, and metabolic equivalents (METS) per day during the almond intervention versus the control. No difference in the wear time was detected between the trials, which allows for an accurate comparison of activity data. When running the analysis for average activity kcals per day average steps per day and metabolic equivalents (METS) per day, the results suggested that there is not a statistical difference between trials indicating that the almonds did not influence physical activity; however, there was a trend ($p<0.10$) for greater activity during almond consumption. Future analyses will include additional research subjects, so these data should be viewed as preliminary. Research to date indicates that almond consumption may promote greater physical activity than pretzel consumption; however, the data are preliminary and future analyses will be needed to better understand the potential mechanism.

https://docs.google.com/document/d/1cValfyerb94XOw_J1GavJM_TeAFrkmcHicYxjHOcPwY/edit?usp=sharing

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438 1:00 pm RR

Noise Exposure in Undergraduate Student Musicians

Carly Hunt, Speech, Language, and Hearing Sciences (U)

Many students are listening to music through earphones, and student musicians are exposed to higher levels of noise in the form of music. Data are mixed as to whether this extra exposure affects auditory function, specifically distortion product otoacoustic emissions (DPOAEs). The objectives of this study were to compare questionnaire and DPOAE data between student musicians and non-musicians. A total of 35 undergraduate students (23 musicians and 12 non-musicians; mean age=20.6 yrs; SD=2.3 yrs) participated. Questionnaire data included self-reported personal music (PM) system use with earphones and hearing health-related questions. For musicians, specific questions included number of years played, type of instrument, hours per week of practice, use of hearing protection, and reported tinnitus. Measures were otoscopy, tympanometry with ipsilateral and contralateral 1 kHz acoustic reflex thresholds, and DPOAEs. DPOAE data were obtained from 1-6 kHz using stimulus tones ($L1,L2=55,40$ dB SPL, $f2/f1=1.22$; $f2 >f1$) swept in frequency at 8 sec/octave. All 23 musicians listen to a PM system with earphones and 11 of 12 (91.7%) non-musicians listen to a PM system with earphones. 9 of 23 (39.1%) musicians reported listening at a level where they either have a lot of trouble hearing others or cannot hear others and two non-musicians (16.7%) reported having a lot of trouble hearing others. Musicians reported longer single use of a PM system with earphones (mean=2.75 hours [SD]=2.43) compared to non-musicians (mean=1.79 hours [SD]=0.69). Four musicians (17.4%) reported using hearing protection while they played/practiced their instrument and seven (30.4%) reported tinnitus after playing/practicing. All middle ear measures were similar between student musicians and non-musicians. All participants had measurable DPOAEs across the frequencies tested. Mean DPOAEs were similar between student musicians and non-musicians, but music major musicians had slightly lower mean DPOAEs at 4 and 6 kHz. Overall, musicians reported using their personal music system for more time, at a higher level than non musicians. However, middle ear measures and DPOAE data were similar between musicians and non musicians.

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439 1:00 pm SS

Vietnamese classifiers in stories: Case examples from children with and without language disorder

Khanh Nguyen, Speech, Language, Hearing Sciences (M)

Developmental Language Disorder (DLD), also known as Specific Language Impairment (SLI), is a language impairment that has long-term impacts on a child’s social and academic development (Bishop et al., 2017). Similar to a prevalence rate found globally, Pham et al. (2019) reported that 7% of kindergarten children in Vietnam were at risk for DLD. Children with DLD show particular difficulty with acquiring grammatical features. A distinct grammatical feature of Vietnamese is classifiers. Classifiers are words that precede a noun and provide additional information about its countability, definiteness, and category (e.g. animate and inanimate) (Hao, 1988; Phan & Lam, 2021). Classifier omission was found to be one of the most common errors among Vietnamese kindergarteners, (Pham et al., 2019). Understanding how children with and without DLD use classifiers, and whether their errors persist over time, is useful for characterizing the disorder in Vietnamese. Thus, the purpose of this study is to

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examine the use of classifiers of 12 Vietnamese children, 6 with DLD and 6 without DLD, matched by age and gender. Children participated in a storytelling task, using a wordless picture book (Mayer, 1967), in three consecutive years (kindergarten, first, and second grade) for a total of 36 samples (3 per child). Their language samples were audio recorded and transcribed using SALT software. A linguistic analysis was conducted to compare and contrast classifier use between the typically developing children and children with DLD, and across the three time points. Classifier use was measured in terms of accuracy (classifier omission errors), diversity (number of different classifiers produced), and productivity (number of different syntactic constructions with classifiers). Preliminary analysis suggests that children with DLD show reduced classifier diversity and productivity but then catch up to their typical peers by second grade. There might also be potential group differences between how classifiers are used with the main characters of the story versus peripheral object nouns. Ongoing analysis will confirm whether these patterns are robust across participants. Findings will contribute to a broader understanding of Vietnamese language development and potential indicators of a language disorder.

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440 1:00 pm TT

Speech-Monitoring in Overt Language Production

Coral Rodriguez, Speech Language and Hearing Sciences (U)

Speech is consistently being monitored during verbal communication. If an individual makes a verbal error, they can stop and correct their speech. According to the conflict-based monitoring account1, self-monitoring during speech production occurs through the detection of conflict between opposing responses resolved by domain-general cognitive control. The left temporal lobe is often investigated in language research given its contribution to core language functions for picture naming, including: semantic, lexical, phonological access and speech monitoring. Patients with temporal lobe epilepsy have been documented to present deficits during expressive language tasks3. The present study investigates speech-monitoring processes in patients with intractable epilepsy and seizures stemming mostly from the temporal lobe by comparing their performance on a picture naming task to that of healthy age-matched adult controls. A total of 16 patients (9 males; μ age: 29.4 yrs; SD: 12.7) and 12 controls (6 males; μ age: 39.8 yrs; SD 9.3) participated and produced at least 5 true speech errors (i.e. producing an incorrect naming response). Data was collected in person at the University of California, San Diego Medical Center for patients, and online using LabVanced for controls. Preliminary results show reaction times were faster for correct overt responses in controls (μ correct: 938.7ms; SD: 121.6; μ errors: 1097.4ms; SD: 226.6; p = 0.015) and patients (μ correct: 1108.9ms; SD: 190.6; μ errors: 1438.1ms; SD: 242.3; p <0.01). We found a difference in reaction times between controls and patients for both correct (p= 0.006) and error (p = 0.003) responses. The number of errors that controls made (μ: 10.75; SD: 3.1) were similar to the number of errors that patients made (mean: 9.5; SD: 3.3; p = 0.5). In line with previously reported deficits in expressive language tasks, these results are in agreement with our prediction that patients with intractable epilepsy had overall longer reaction times compared to control participants. However, they did not show increased error rates compared to control participants. This gives nuance to potential speech monitoring deficits and requires further investigation.

References:

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[2] Vogt, A., Hauber, R. C., Kuhlen, A. K., & Abdel Rahman, R. (2021, February 9). Internet based language production research with overt articulation: Proof of concept, challenges, and practical advice. https://doi.org/10.31234/osf.io/cyvwf

[3] Bell, B. D., Hermann, B. P., Woodard, A. R., Jones, J. E., Rutecki, P. A., Sheth, R., Dow, C. C., & Seidenberg, M. (2001). Object naming and semantic knowledge in temporal lobe epilepsy. Neuropsychology, 15(4), 434–443. https://doi.org/10.1037//0894-4105.15.4.434

Session H-8

Poster Interdisciplinary 1

Friday, March 4, 2022, 1:00 pm

Location: Montezuma Hall

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441 1:00 pm UU

Chemical leachates from cigarette butt litter impair embryonic development in the zebrafish, Danio rerio

Isabella Sardo, Public Health (U)

Cigarette butts are one of the most common forms of litter in the environment today. Each cigarette contains numerous toxic chemical contaminants such as arsenic, nicotine, polycyclic aromatic hydrocarbons (PAHs), formaldehyde, and lead. While a majority of these compounds are well-known carcinogens, reproductive toxicants, or toxic to other systems, hundreds of additional chemical constituents and their transformed products have yet to be toxicologically profiled. The goal of our study was to assess whether cigarette butt litter impacts embryonic development, using the zebrafish as an aquatic model that also translates to human development. Zebrafish embryos were exposed to cigarette butt leachates at concentrations of 0, 0.1, 0.5, or 1 cigarette butt per liter from 1-4 days post fertilization (dpf). Morphological development, survival, and metabolic activity were observed using quantitative microscopy. Decreased fish length, impaired liver development, and increased yolk edema were observed in exposed embryos. Embryos were also co-exposed to 7-ethoxyresorufin, a non-toxic chemical that becomes fluorescent when metabolized by Cyp1a--a xenobiotic metabolizing enzyme. Fluorescence was significantly decreased due to cigarette butt leachate exposure. From these results, we conclude that embryonic development is impaired due to cigarette butt leachate exposures, namely hindering growth, inducing edema, and decreased Cyp1a activity. This research demonstrates a clear anthropogenic risk to aquatic ecosystems, as well as human health, since many of these compounds bioaccumulate before fish and other species are consumed by humans. Though cigarette butts may be characterized as hazardous wastes in California, more emphasis on convenient and abundant disposal opportunities would help to reduce these products from deposition into our waterways, preventing this environmental challenge.

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442 1:00 pm VV

Infiltration and soil moisture variability in Alvarado Creek

Gabriel Goncalves-Santana, Geology (U)

Soil infiltration is highly variable and depends upon many aspects such as the chemical-physical composition and hydraulic properties of the sediments, soil texture and structure, distribution of soil moisture, slope, depth to groundwater, biological activity, or season. This work will augment an existing database of infiltration measurements in an urban riverine system to identify variables that influence soil infiltration variability. This study is based on previous work that collected monthly infiltration and soil moisture across three transects in Alvarado Creek, a tributary of the San Diego River. In this study, we will expand the sampling and analyses to a larger portion of the creek with 16 additional locations. Specifically, we will measure average infiltration and soil moisture in the field with respect to four variables: 1) soil type, 2) slope aspect, 3) vegetation, and 4) geomorphic features and collect duplicate soil samples to bring to the laboratory for additional analyses. Samples will be refrigerated and left at room temperature for 24 hours prior to the experiments. A Mini Disk Infiltrometer will be used to measure the infiltration and a Campbell Scientific Hydrosense II attached to a C659 probe will be used to measure soil moisture in the field. All soil samples collected will also be stored for sieve analysis to characterize the soils. This information will improve our understanding of urban riverine processes and provide information needed to parameterize future hydrologic and hydraulic modeling efforts of Alvarado Creek.

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443 1:00 pm WW

Measuring the Impact of Arundo donax on Infiltration Processes

Kathryn Tippett, Mechanical Engineering (U)

Arundo donax is an invasive vegetation species in southern California, which can significantly alter riparian ecosystems. Soil infiltration rates, the rate of water entering the soil, are important for floodplain processes and are likely disrupted by the presence of Arundo donax. The Arundo donax out-competes native vegetation and the rhizome root system promotes undercutting, sedimentation, and lateral migration of stream flows, which can contribute to a grass-fire cycle. It is hypothesized that the infiltration rates in the riparian area overwhelmed by Arundo donax will be different from areas with native plants, due to its extensive rhizome root system. This work will investigate the presence of Arundo donax on infiltration in Alvarado Creek, a tributary of the San Diego River. The field design intends to capture the variability of infiltration in the riparian area. Specifically, soil cores will be taken at the base of three Arundo donax stands and radiating outwards in the cardinal directions (north, east, south, west) at two, and four meters away from the initial locations. Nine samples, in duplicate to capture variability, will be collected for each location, totaling 18 cores per stand. The sampled stands of Arundo donax are located adjacent to the Creek, ensuring the soil cores are not saturated with water. Infiltration measurements of the soil cores will be measured in the lab using a mini-disk infiltrometer. Measurements will be taken in the field to compare to the data collected in the lab. This work builds on the current knowledge of the effects of Arundo donax along the Alvarado Creek, and will be incorporated into future hydraulic and hydrologic modeling of the system, which can inform land management in San Diego.

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444 1:00 pm XX

Persistence, Removal, and Transformation Products of Trace Organic Compounds in Sunlight-Exposed Secondary Wastewater Effluent

Thomas Morales, Environmental Health (M)

There are a great number of effluent derived chemicals (including pharmaceuticals and personal care products (PPCPs)) that may persist through traditional wastewater treatment methods (primary and secondary treatment) and enter the environment in effluent discharged to receiving waters. The chemicals that are persisting through traditional treatment have the potential to pose risk of ecotoxicological harm to both aquatic organisms and humans alike. Sunlight is known to photodegrade compounds, both directly and indirectly, by oxidizing the compounds, producing reactive radicals that can degrade compounds, and transform compounds to smaller and more labile compounds that can be degraded by microorganisms. The purpose of this study was to evaluate the photo transformation of organic matter, photodegradation of trace organic contaminants, and evaluate the role that microorganisms play in mineralization using laboratory experiments to simulate treatment in polishing ponds. To achieve this goal, we conducted a set of photoirradiation experiments using solar simulation of natural sunlight and dark conditions (control) with sterile-filtered (bacterial free) and unfiltered samples of secondary wastewater effluent. The effluent was collected from a wastewater treatment plant in North County, San Diego, that uses activated sludge for secondary treatment. Half of the effluent was filtered to remove microbes and the other remained unfiltered, and both sets were exposed to simulated sunlight and dark conditions. We used a non-targeted analysis based on comprehensive two-dimensional gas chromatography coupled to time-of-flight mass spectrometry (GC×GC/TOF-MS) to quantify the number of chromatographic features present under different experimental conditions and to determine behaviors of chemicals by exposure to sunlight in the presence and absence of microbes. Data analysis is in progress.

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445 1:00 pm YY

A Non-targeted Analysis of Tobacco-related Compounds Within the Kendall Frost Reserve

Melissa Pennington, Public Health - Environmental Health (M)

Kendall Frost Marsh Reserve is a wetland preserve in Mission Bay, San Diego, California. Due to urbanization, what was once a 2,000-acre wetland area, is now a 21-acre preserve home to diverse species of flora and fauna. Stormwater pollution and anthropogenic forces make this area especially vulnerable to tobacco product waste (TPW) and chemicals of emerging concern (CEC). Few studies have been performed to identify compounds and their associated risks, especially in natural reserve systems. It is important to identify chemical contaminants within the reserve, as tidal marshes serve as important barriers for storm protection and erosion, as well as productive filters of the watershed between estuaries and the ocean. Water and sediment samples were collected from two sites on 13 separate occasions during wet and dry seasons. Through non-targeted extraction methods and use of GC×GC/TOF-MS software, environmental samples were analyzed. 279 unique, high confidence compounds were identified through this process. Of these, 100 are tobacco (plant) related, 93 are tobacco smoke related, and 77 were tobacco substitute related. There was an abundance of compounds that are human use related products, such as household use, car use, and personal care products. Using the EPA's COMPTOX tool and the EPA TSCA Work Plan screening criteria for identification of persistent organic pollutants, it was identified that water and sediment samples had 17 unique compounds surpass the persistence threshold, 20 unique compounds surpass the bioconcentration threshold, and 25 unique compounds surpass the toxicity threshold. It is important to identify the source of these compounds in order to implement change through policy to ensure preservation of this reserve.

SRS

Abstracts of Presentations

Session I

SAN DIEGO STATE UNIVERSITY

Session I-1

Poster Behavioral and Social Sciences 18
Friday, March 4, 2022, 3:00 pm
Location: Montezuma Hall

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446 3:00 pm A

The Urban Sustainability, Livability, and Equity

Arman Ogandzhanyan, Urban Planning Design & Management (U)

Under the direction of Dr. Bruce Appleyard of San Diego State University, the Urban Sustainability, Livability, and Equity (SLE) research team, supported by the Faculty Student Mentorship Program (FSMP) conducted a study with individuals in southern areas of San Diego. The approach taken to study these dynamics involved conducting cognitive/image mapping exercises with individuals, based on principles set forth by Kevin Lynch's "Image of the City" (Lynch, 1960).

This research uniquely captures the experiences of the different individuals. Principally, we were able to learn about how those that use public transportation perceive the environment of their daily lives. Specifically, to conduct our research we went out into the field to ask individuals to draw maps of their surroundings on their daily routes, which were marked with symbols to identify landmarks. From our review of the maps, we have found that those who take public transportation are often more aware of their surroundings, specifically landmarks. There was one individual that drove their personal vehicle every day and the only landmark they recognized was a park 200 feet from their house.

One participant with a personal vehicle had about double the landmarks in comparison with the rest who also had landmarks. But that was still half the amount of the individual who took public transportation. Most of the landmarks that were picked by individuals with personal vehicles often only picked landmarks that are very crowded, large, and popular, such as a mall, military base or theme park. While the individual that took public transportation noticed areas with fewer people such as a cemetery, schools, and trolley station.

This work can ultimately help promote better quality of life for the average person by helping design and plan for public transportation and services. Through better access to services and opportunities and better ways to help them meet their most critical needs, the home territories and lives of all can be improved.

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447 3:00 pm B

Mapping the Everyday Lives of the Houseless

Michael Rumfola, Sustainability (U)

Under the direction of Dr. Bruce Appleyard of San Diego State University, the Urban Sustainability, Livability, and Equity (SLE) research team, supported by the Faculty Student Mentorship Program (FSMP) conducted a study with houseless individuals in urban areas of San Diego and Los Angeles. The approach taken to study these dynamics involved conducting cognitive/image mapping exercises with houseless individuals, based on principles set forth by Kevin Lynch's "Image of the City" (Lynch, 1960).

This research uniquely captures the experiences of the houseless. Principally, we were able to learn about how the houseless perceive the environment of their daily lives – what places are important to them, and what barriers exist. Essentially we were looking at all the critical elements of their home territories – where they find food, water, satisfy their toilet needs, etc. In sum, we captured the key components of what could be considered their homes. Allowing them to subjectively recreate their experiences through cognitive mapping enables us to gain an empathetic understanding of their experiences and an opportunity to address their needs through human-centered design approaches.

To conduct our research we asked houseless individuals to draw maps of their surroundings and daily routines, which were marked with symbols to identify important locations. 112 total maps were gathered - 103 maps (92%) were drawn in the San Diego area and 9 maps (8%) were drawn in the Los Angeles area. From our review of over 100 maps, we have found 13 consistent patterns. One of them is that the houseless often travel in regular routes throughout their day, sometimes using transit or bicycling, but often on foot. This speaks to the need for services to be close to where the houseless live to support their mobility restrictions. Some participants were employed, with some choosing to work for free to help clean the streets or shops they frequented. Parks and alleys were marked as places of importance as they offered safe spaces to congregate and travel through. Some important additional findings include the need for safe storage, adequate public restroom access, and a better relationship with law enforcement.

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448 3:00 pm C

A Maize of Causation: A Bioarchaeological Case Study of Nasal Fractures and Agricultural Intensification

Megan Carey, Anthropology (M)

The transition from horticulture to agriculture is necessarily accompanied by major population, social, and economic change. The people of the Lower Illinois River Valley (LIRV) experienced the transition to intensive maize agriculture during the Late Woodland Period (ca. 400 – 1050 CE). When compared to the LIRV populations during the earlier periods of the Middle Woodland (ca. 50 BCE – 400 CE) and the Early-Late Woodland (ca. 400 – 800 CE), the agriculturally-intensive population during the Late-Late Woodland (ca. 800 – 1050 CE) experienced a marked increase in the prevalence of a specific type of facial trauma: blunt-force nasal and paranasal fractures. An initial analysis of an assemblage of crania [n=301] from the Illinois Bluffs in Jersey County, Illinois identified 20 individuals [6.66%] with nasal and/or paranasal fractures. The associated trauma patterns indicate that multiple individuals in this community received precise and isolated impacts to their noses. Due to the absence of a pattern of generalized cranial trauma, these fractures are unlikely to be the result of inter-community conflict. Multiple hypotheses potentially explain this observation in the context of a society in transition. For instance, the new social order that developed with agricultural intensification could have resulted in an increase in intra-community interpersonal violence, such as domestic violence. Alternatively, the development of new agricultural technologies could have introduced new types of occupational injury. This study will utilize statistical analyses to establish correlations between estimated sex, occupational dental wear, mandibular disfunction, and nasal/paranasal fractures in order to test these hypotheses and identify the probable mechanism of trauma: occupational injury or interpersonal violence.

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449 3:00 pm D

Across-agency partnerships and within-agency capacities shape how stakeholder agencies address food insecurity: perspectives of key informants in San Diego County

Lani Morales, Exercise and Nutritional Sciences (M)

Background: Food insecurity (FI) is the household-level economic and social condition of limited or uncertain access to adequate food. FI is an ongoing issue in the United States and disproportionally affects racial/ethnic minority groups, especially Hispanics/Latinos. Before the pandemic, 43% of Hispanics/Latinos, compared to 29% of Whites, living below 200% of the Federal Poverty Level in San Diego County experienced FI. Ensuring FI is important to preventing disparities in diet-related diseases and conditions, such as cardiovascular disease, obesity, and diabetes. Capacity-oriented approaches show potential to improve health and reduce FI and health disparities in low-resources settings, yet local data are needed to establish effective, sustainable solutions specific to San Diego County.

Objective: The overarching goal of this study was to identify multi-level sources of existing capital (resources) in San Diego County to inform an integrated approach to reducing FI and improving dietary intake.

Methods: Guided by the Socioecological Model, we conducted face-to-face, semi-structured interviews with key informants (leaders) at local stakeholder agencies addressing FI across San Diego County. Key informants were invited through phone and email to participate. Interviews were audio-recorded, transcribed verbatim, and checked for accuracy. The research team reviewed and discussed each transcript to generate an initial codebook. Then, student researchers iteratively coded all transcripts in NVivo using the codebook. The research team met regularly to discuss coding and identify emergent themes.

Results: Key informants at 16 stakeholder agencies completed interviews. Results showcased two interrelated themes: 1) across-agency partnerships and 2) within-agency capacities. Strong across-agency partnerships enabled distinct agencies to address FI more effectively and holistically by connecting clients to other services (e.g., housing, mental health) related to FI. Working in tandem within and across-agency partnerships and social capital (e.g., volunteers, staff-client relationships, cultural competency) influenced the reach and impact of these individual agencies, allowing them to provide clients with personalized, holistic care.

Conclusions: The combination of across-agency partnerships and within-agency capacities influenced the effectiveness of San Diego County stakeholder agencies in addressing FI among low-resource communities. Future research should consider how to further leverage and strengthen these existing capacities to reduce the burden of FI.

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450 3:00 pm E

COVID-19 Vaccine Hesitancy among Mexican-Americans in the Imperial Valley

Andrea Van Bebber, Psychology (U)

Despite the fact that COVID-19 vaccines have been widely available in the US for some time, a significant proportion of the population remains unvaccinated. Vaccine hesitancy is particularly noted among racial and ethnic minorities, reflecting existing inequalities in COVID-19 infection and mortality rates (Khubchandani & Macias, 2021; Callaghan et al., 2021). Contributing factors may include medical mistrust due to past racism and greater exposure to misinformation (Bogart et al., 2021; Khubchandani & Macias, 2021). Vaccine refusal more generally is also associated with higher levels of political conservatism and religiosity (Callaghan et al., 2021). Due to the continuing impact of the pandemic, there is a need for information on how these and other factors operate in different populations. One understudied region is California's Imperial Valley, a rural agricultural region that borders on Mexico and has a predominantly Mexican-American population. Studies suggest that such populations may mistrust medical institutions due to fear of job loss and deportation, while language barriers may make them more susceptible to misinformation (Gehlback et al., 2021). In our study, we therefore used a Qualtrics survey to examine the relationship between demographic, socio-cultural, and psychological factors and COVID-19 vaccine hesitancy among 50 adults in the Imperial Valley. Our predictor variables included demographic factors (e.g., ethnicity, language, education, employment, and income), and measures of conservatism, religiosity, individualism, and attitudes about science. We also asked about participants' sources of information about COVID-19 and about their trust in different sources. Our outcome measures included whether participants had been vaccinated (and how many doses) and why or why not. We also asked about specific misconceptions about the COVID-19 vaccine, including purported side-effects like infertility, that it is part of a political plot, and about alternative treatments like Ivermectin. We analyzed the data using logistic regression to see what factors contributed to participants not getting the vaccine. Our preliminary results suggest that misinformation continues to be prevalent and associated with higher levels of vaccine hesitancy among Mexican-Americans in this region. Positive attitudes about science, however, may counter these effects. This suggests the need for better science education and communication for diverse populations.

(U) = Undergraduate; (M) = Masters; (D) = Doctoral

451 3:00 pm F

County-Level Political Orientation Predicts Implicit Bias against Native Americans

Nancy Moreno, Psychology (M)

The role of political orientation in intergroup biases has typically been examined at the individual level. In the present research, we tested whether the political orientation of the context in which individuals are immersed accounts for implicit bias against Native Americans. More precisely, we hypothesized that the implicit assumption that Native Americans are less American than White Americans would be more pronounced among individuals reared in relatively conservative counties compared to individuals reared in relatively liberal counties. In addition, we tested whether this relationship held when we controlled for several socio-demographic characteristics of participants, including their political orientation, and other county-level socio-structural variables. We relied on data collected using the Native-White American Identity Implicit Association Test (IAT) available on Project Implicit between 2004 and 2020 (N = 255,498 nested within 1,142 counties). The political orientation of counties was determined based on the outcome of Presidential Elections during the same period. Other county-level indicators were based on the 2010 US Census and the American Community Survey. Overall, Native Americans were less strongly associated with the American identity than White Americans were. As predicted, this implicit bias was stronger in counties voting for Republican, rather than Democratic, nominees. This relationship held when we controlled for the political orientation, ethnic identity, age, gender, and level of education of participants and for the ethnic diversity, median income, income inequalities, proportion of US citizens, and population density of counties. In line with a socio-cultural perspective, the political orientation of the context in which individuals live predicts the extent to which they display implicit bias against Native Americans. Conservative counties are characterized by a relatively exclusionary American identity, whereas liberal counties are associated with responses that are more inclusive. The current study emphasizes the importance of examining the effects of contextual factors on implicit biases. Implicit anti-Native American reactions cannot be reduced to individual-level factors; they are also deeply embedded in local socio-political contexts. Going past the individual level of analysis provides a more holistic view of implicit interethnic biases that acknowledges their socio-cultural foundations.

452 3:00 pm G

Aging out of dependent coverage and health insurance trends

Brittney Seidemann, Public Health: Health Management and Policy (M)

Prior to 2010, young adults had the highest uninsured rate of any age group. The Affordable Care Act's (ACA) September 2010 dependent coverage expansion allowed young adults to remain insured on a parent's health plan until their 26th birthday. Research has shown that the dependent coverage expansion resulted in large coverage gains among young adults ages 19-25.

While a large body of research has studied changes in health insurance coverage among 19–25-year-olds before and after the 2010 policy implementation, there is little research that focuses on what happens when adults age out of dependent coverage. Further, the small number of studies that address this topic use data from before the 2014 implementation of the ACA's Medicaid and Marketplace expansions. This is an important omission as the 2014 health insurance expansions provided new coverage options for adults aging out of dependent coverage who met eligibility requirements. This research aims to fill this gap in the literature by examining trends in health insurance and sources of coverage among those who age out of dependent coverage after turning 26 years old.

By analyzing nationally representative 2008-2019 data from the American Community Survey, this study will be able to compare the effects of turning age 26 during 3 periods: (1) before the 2010 implementation of dependent coverage, (2) after implementation of dependent coverage and before 2014, and (3) after the 2014 implementation of the ACA's Medicaid and Marketplace expansions. Our regression discontinuity design will examine discontinuous changes in health insurance outcomes (private insurance - any, employer sponsored insurance, direct purchase insurance, Medicaid, and uninsured) at age 26. Model controls will include an indicator for being age 26 or older, age in years, race and ethnicity, sex, highest educational attainment, employment status, marital status, and income as a percentage of the federal poverty level. The coefficient on the age 26 indicator is the main estimate of interest. The study sample will include adults ages 19-30. Our preliminary analysis of unadjusted health insurance trends suggests that the uninsured rate increases at age 26, but these effects are smaller after 2014 relative to earlier periods.

Session I-2

Poster Behavioral and Social Sciences 19

Friday, March 4, 2022, 3:00 pm

Location: Montezuma Hall

453 3:00 pm H

Odor Identification Score, ApoE e4 Status, and Age are Associated with Thickness of Medial Temporal Lobe Structures

Conner Frank, Clinical Psychology (D)

There is significant evidence that decreases in odor identification scores are associated with the early Alzheimer's Disease (AD) neuropathology, and these decreases in odor identification scores have been found to be related to hippocampal volume and entorhinal cortex (EC) thickness in patients with AD (Murphy, Jernigan, & Fennema-Notestine, 2003). This study sought to test whether similar relationships exist between cortical thickness of the perirhinal cortex (PC), parahippocampal gyrus (PHG), and EC and interactions between age, San Diego Odor Identification (SDOIT) scores, and genetic risk for AD, measured by Apolipoprotein E e4 (ApoE e4) status. Cortical thickness estimates from MRI structural imaging at 3T of the EC, PC, and PHG from 69 older adults, adjusted as a ratio of mean cortical thickness, were analyzed using multiple linear regression analyses, with SDOIT scores, dummy coded ApoE e4 status, and age, as well ApoE e4 status x age and ApoE e4 status x SDOIT interaction terms as predictors. Omnibus F-tests were significant for the left EC ($p = .024$, $R2 = .182$), right EC ($p = .013$, $R2 = .201$), left PC ($p = .009$, $R2 = .211$), and right PC ($p = .026$, $R2 = .180$). Significant interactions between ApoE e4 status and SDOIT scores were observed for the left EC ($b = -.071$, $p = .013$), right EC ($b = -.065$, $p = .020$), and left PC ($b = -.054$, $p = .023$), while significant interaction effects between age and ApoE e4 status were observed for the left ($b = -.016$, $p = .046$) and right ECs ($b = -.018$, $p = .019$). These findings provide evidence that olfactory deficits accompanied by other AD risk factors can be a useful indicator of potential early AD neuropathology. Future studies might seek to further understand this relationship by combining other AD biomarkers, such as fluid measures, functional neuroimaging, and other measures, such as education level and global health measures.

Supported by NIH grants R01AG04085-26 and R01AG062006-04 to CM. We thank the participants, the UCSD Alzheimer's Disease Research Center, and other members of the SDSU Lifespan Human Senses Laboratory.

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454 3:00 pm I

Examining Discrepancies between Self and Informant Ratings from the Social Responsiveness Scale in Adults with ASD

Mira Wittenberg, Psychology (U)

Autism Spectrum Disorders (ASD) are lifelong neurodevelopmental conditions that have varying impact on aspects of social interaction along with other symptoms. The Social Responsiveness Scale, Second Edition (SRS-2) is a questionnaire designed to assess social deficits, with self and informant report versions. Concordance between teacher-report and parent-report versions of the SRS-2 have been examined in children and adolescents, but there has been no investigation into differences between the self-report and informant-report forms of the adult SRS-2. The present study examined discrepancies between self and informant ratings of social behavior in adults with ASD.

Nineteen participants with ASD, aged 40-67 years, were given both the self and informant report versions of the SRS-2 questionnaire. The questionnaire consists of 65 items measuring aspects of social function (awareness, cognition, communication, motivation) and restricted and repetitive behaviors. Paired-samples t-tests were run to test for true differences between self and informant report scores. Pearson correlations were used to examine relationships between self and informant report scores. Linear regression was used to investigate possible influences on interrater discrepancies, which were calculated as the z-score difference between scores from the self and informant reports. Separate regression models were used for each SRS-2 subscale score and the total score, with discrepancy scores as the outcome variable and age, Verbal Comprehension Index (VCI), and Perceptual Reasoning Index (PRI) scores from the Wechsler Abbreviated Scale of Intelligence, Second Edition (WASI-2) as explanatory variables.

T-tests showed no significant differences between the subscores based on rater, but scores from the self and informant reports were also found not to be significantly correlated with one another. Further investigation revealed that VCI and PRI were significantly associated with interrater discrepancies on the Social Motivation subscale. With higher VCI scores were associated with greater discrepancies ($p = 0.002$), but higher PRI scores were associated with smaller discrepancies ($p = 0.001$).

The finding that VCI and PRI have opposing associations with interrater discrepancies provides valuable insight into influences on symptom ratings in ASD. Examining the discrepancy between ratings allows us to better understand the influence of cognitive abilities on social deficits in ASD.

455 3:00 pm J

Lived Experiences of Young-Adult Spanish-English Bilinguals with and without Developmental Language Disorder

Halie Shea Doan, Speech Language Hearing Sciences (U)

Introduction: Developmental Language Disorder (DLD) is the most common child language disorder. Limited research in monolinguals has revealed long-term differences to peers without DLD in social, academic, and vocational success, and no current work is available in bilinguals. The purpose of this study is to examine themes in lived communication experiences of 18-21 y/o Spanish-English bilinguals in non-academic, academic, and vocational contexts through phenomenological interviewing.

Research Questions (RQ): (1)Do language environments differ for participants with and without a history of DLD?(2)Are there qualitative differences related to language challenges for individuals with and without a history of DLD?

Hypothesis: We hypothesize that qualitative themes will emerge from interviews on context-dependent communication experiences, and that participants with a history of DLD will report fewer distinct language contexts than their peers.

Methods: Seven 18-21 y/o students (NoDLD=4,HxDLD=3) completed two phenomenological interviews discussing their experiences communicating in different contexts. Data were analyzed qualitatively through a grounded theory approach and coded with a quantitative component combining experiences shared across participants. Participants' language environments were counted and coded into three categories (1) Single-language contexts, (2)Dual-language contexts, and (3) dense code-switching contexts.

Results:

RQ1: Language environments

Mann-Whitney U: There were no differences between either group on the number or proportion of communities that could be described as "inner circle" or "outer circle", ps>.1. NoDLD participants reported marginally more dual-language environments, U(4,3)=10, z=1.48, p=.07.

RQ2: Qualitative Themes

Six themes were identified when participants explained communication difficulties/challenges. A Phi coefficient correlation found no relation between DLD status and the proportion of participants who reported communication difficulties/challenges, ps>.1. A Point-Biserial correlation found no relation between DLD status and the proportion of participants who reported any of the 6 themes, ps>.1.

Qualitative analyses showed that, while both groups recognized they had difficulties communicating at times, all HxDLD participants indicated they didn't know the cause of some of their difficulties. Half of participants without DLD indicated tip-of-the-tongue states, while none of the HxDLD participants did.

Conclusion:Preliminary findings suggest that bilinguals with and without a hxDLD show similarities but also some differences in their bilingual experiences. Additional data are needed to confirm these findings.

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456 3:00 pm K

Recognition Errors when Learning Novel Words

Amber Henmi, Speech Language and Hearing Sciences (U)

Word learning is an essential aspect of communication and continues to develop throughout one's lifespan. For a word to be learned, the meaning needs to be encoded and later retrieved. In this study, we asked if retrieval errors can tell us about the depth of novel word encoding.

Methods/Participants:

Sixty-five monolingual adult participants completed two online tasks: a word learning task (WLT), designed for encoding a new word's meaning, and a retrieval task. In the WLT, participants read 15 sentence triplets that introduced novel words with their meanings. In the retrieval task, participants saw the novel word and a screen with five pictures (one representing the correct meaning, three representing incorrect meanings (i.e., foils), and a red "x" representing no meaning) and selected the image that they believed best represented the novel word. There were three types of foils: unlearned categorically-related, learned non-categorically-related, and unlearned-unrelated. For example, if the novel word's target meaning was "apple," a categorically-related foil would be "banana," which is in the same category (fruit) as the target but was not another word introduced in the WLT. A learned non-categorically-related foil would be "couch," which is in a different category as the target but was another word introduced in the WLT. An unlearned-unrelated foil would be a random word that was in a different category than the target and never introduced during the WLT, such as "fan." This study focuses on the data where participants correctly identified the novel word's meaning in the WLT, but chose the incorrect answer (a foil) in the retrieval task.

Hypothesis:

We hypothesize that even if the participant did not fully encode the novel word's meaning, evidenced by incorrect retrieval task answer, the deeper they encoded the word, the more likely they will choose a categorically related foil.

Conclusion:

Conclusions will discuss how the depth of novel word encoding affects the participants' retrieval of the novel word. This relationship will give us more insight into how adults encode new words.

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457 3:00 pm L

Piloting an online study to assess Knowledge Learning, Inhibition, and Comprehension in young children

Selena Llanes, Speech, Language, & Hearing Sciences (U)

Approximately 7% of children in Kindergarten have Developmental Language Disorder (DLD; Tomblin et al., 1997). Children with DLD exhibit deficits in both comprehension and production of language. Predominantly, research on DLD has focused on production-based deficits in vocabulary and grammar (e.g. Law et al., 2004), which ignores comprehension-based deficits. A critical component of comprehension is activation and integration of prior knowledge with incoming linguistic information (e.g. Kamalski et al., 2008; Kintsch, 1988; McNamara & Kintsch, 1996). Despite its acceptance as a primary factor in comprehension, there is little experimental work on assessment and treatment to improve knowledge, especially in preschoolers with DLD. deficit. If knowledge is intact but comprehension remains impaired, it is critical to determine if the breakdown occurs in accessing knowledge rather than the encoding of knowledge. In this study, we examine the relationship of knowledge and story comprehension in preschoolers with and without developmental language disorder and determine the role encoding (learning) and processing (inhibitory control) of knowledge has in successful comprehension. The current study with young children with and without DLD is comprised of five tasks that include: 1) a receptive vocabulary probe to measure domain-specific knowledge, 2) a knowledge learning task in which children are taught and asked to recall novel facts in a narrative context, 3) a comprehension task in which children listen to a narrative containing the novel facts and ask comprehension questions, 4) a linguistic inhibition task to measure the effectiveness of suppressing domain general knowledge in the presence of newly learned knowledge; and 5) a non-linguistic inhibition task to measure suppression skills without linguistic demands. We specifically converted the experimental tasks to a web-based platform for flexibility in data collection so that it could be done in-person or remotely.

We hypothesize that children with DLD will demonstrate lower performances on learning, comprehension, and inhibition compared to children with typical language. We also plan to pilot young bilingual children with and without DLD and hypothesize we will see differences amongst all groups but see a bilingual advantage that aids in inhibition tasks.

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458 3:00 pm M

Experiences of speech-language pathologists in the Philippines

Danielle Guevarra, Speech, Language, and Hearing Sciences (M)

The field of speech-language pathology (SLP) was established in the Philippines in 1978, and since then, the number of field-related college training programs and service-providing programs have steadily increased. Though these growing services have existed in the country for over 40 years, there are large areas of need, such as a lack of developmental speech and language norms, lack of culturally and linguistically appropriate assessment tools, and limited client accessibility to services. This leaves clients vulnerable to underdiagnosis, overdiagnosis, and misdiagnosis as speech-language pathologists (SLPs) are left relying on subjective clinical judgement during their assessment process. The objectives of this study are to examine the 1) work environment, and 2) assessment process experiences and needs of SLPs working with clients in the Philippines in order to understand the needs and implications for the advancement of the country's SLP clinical practice. This cross-sectional study used convenience sampling to recruit participants to complete an anonymous, electronic survey. Eligible participants were SLPs who had current or previous experience working with clients in the Philippines. Respondents (n=33) were primarily located in the Metro Manila area in the National Capital Region (NCR), used the Tagalog/Filipino and English languages with clients, worked with pediatric aged clients, and associated with the Philippine Association of Speech Pathologists (PASP). Respondents reported a number of concerns, including a lack of culturally and linguistically appropriate assessment tools, a lack of appropriately normed speech and language developmental norms, limited reliability and validity in the current diagnosis process, and inaccurate direct translations of Western standardized assessments. Other concerns include finding and developing appropriate materials for clients speaking other Philippine languages and dialects, regulation of SLP clinical practice standards, and more resources for continuing education units and licensure requirements. These findings suggest that there are major areas that need to be addressed in order to advance SLP clinical practice in the Philippines.

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459 3:00 pm N

An electrophysiological megastudy of object recognition

Sofia Ortega, Psychology (U)

Previous researchers have conducted electrophysiological megastudies of word recognition focusing on printed words, auditory words, and sign stimuli. This study brings that same approach to the investigation of the temporal nature of object recognition with a large set of stimuli. Psycholinguistic studies have used event-related potentials (ERPs) to identify various time-specific waveforms linked to different components of word recognition, such as orthography, phonology, and semantics. By time-locking the electroencephalogram (EEG) signal to the onset of a stimulus, ERPs present millisecond-by-millisecond changes in electrical activity that reflect the processing of a given stimulus. Observed language effects have shown sensitivity to characteristics such as word length, word frequency or familiarity, and orthographic, phonological, and semantic neighborhood. In the present study, ERPs were used to track the neural processing of object recognition and to evaluate potential similarities to known effects in word recognition. In previous visual and auditory ERP studies, low-frequency words tend to elicit increased N400 amplitudes. To reflect the concept of word frequency, familiarity data were gathered on the object stimuli. Normative data on image familiarity were collected through Amazon Mechanical Turk (MTurk) employee attributions. MTurk participants were asked to rate their familiarity with an image on a seven-point Likert scale (very unfamiliar to very familiar). A median split was performed on this data to provide low/high familiarity categories. EEG was recorded from 32 electrode sites while participants engaged in a go/no-go object decision task, identifying non-objects. Object stimuli consisted of 900 colored pictures of real objects gathered partially from an available database and image search engines (e.g., Google) and 100 non-objects. Examples of non-object stimuli include: abstract shapes, representations of fictitious things, and manipulated images of real objects. Stimuli were presented in four blocks in a pseudorandomized order. Block order was counterbalanced across subjects. The preliminary results (N = 7) have shown a delayed N400 with increased negativity for less familiar stimuli. These findings suggest that picture processing may elicit neural responses similar to respective lexical conditions (e.g., frequency). Further investigations will explore categorical differences and monitor ERP components.

Session I-3

Poster Behavioral and Social Sciences 20
Friday, March 4, 2022, 3:00 pm
Location: Montezuma Hall

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460 3:00 pm O

Bringing PrEP Well to Scale: Qualitative Insights to Inform Implementation of Comprehensive PrEP Services in a Trans Community Center in Los Angeles

Hannah Reynolds, Public Health (U)

HIV prevalence among transgender women—particularly those of racial/ethnic minorities—is the highest in the U.S. The odds of a trans woman having HIV is estimated to be over 30 times that of other U.S. adult populations, and rising. Researchers from SDSU, RAND Corporation, and the LA LGBT Center are collaborating to bring comprehensive PrEP services to scale at the Transgender Wellness Center (TWC), a program of community-based, transgender-allied healthcare providers that serves a racially, ethnically, and economically diverse transgender community in LA. The PrEP Well project aims to identify the broad health needs of TWC clients by pinpointing service gaps in the provision of HIV prevention services and collects data on clients' and providers' preferences for the implementation of PrEP services at the TWC. In year 1 of the PrEP Well project, qualitative data was collected through individual interviews with TWC clients (n=30; 11 Spanish-speaking, 19 English-speaking) as well as with TWC providers and stakeholders (n=10). All interviews were recorded, professionally transcribed, and analyzed using rapid qualitative analysis to identify salient themes.Similar themes emerged throughout the participant interviews including awareness of PrEP, but a low rate of PrEP uptake and a need for assistance with transportation to and from PrEP-related appointments. Participants cited a lack of access to PrEP due to perceptions about costs, social stigma, and/or fear of potential side effects. Other themes included a distrust of healthcare providers and a lack of trans providers and providers of color. Themes from provider and stakeholder interviews related to strategies to bring PrEP Well to scale within the existing TWC infrastructure, including the need for increased staff and providers, novel community-centered outreach strategies, and leadership buy-in. All providers/stakeholders emphasized the importance of offering incentives to clients who participate in the program.This study identified information to bring comprehensive PrEP services to scale at the TWC. Through qualitative analysis, the needs, ideas, and preferences of TWC clients, providers, and stakeholders will inform the implementation of a comprehensive "one-stop-shop" PrEP clinic.

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461 3:00 pm P

Patient and Provider Perceptions on the Acceptability and Feasibility of a Pilot Program Screening and Linking Patients to PrEP Services in Primary Care

Sandhya Muthuramalingam, Public Health (U)

Pre-exposure prophylaxis (PrEP) is a widely-promoted prevention strategy for groups at elevated risk for HIV such as sexual minority men (SMM). However, it is estimated that only ~25% of SMM who could benefit from PrEP currently have a prescription. A pilot study implementing routine PrEP screening was conducted in two Kaiser Permanente Southern California (KPSC) primary care clinics to increase rates of uptake of PrEP among men at risk for HIV.

Objective

The objective of this analysis was to examine patients' and providers' perceptions of the accessibility and feasibility of screening and linking patients to PrEP services during routine primary care visits.

Methods

Patients that screened as indicated for PrEP were referred to an infectious disease specialist by their primary care provider for further evaluation and a prescription. Semi-structured interviews were conducted with patients who were screened eligible for PrEP (n=30) and with participating providers (n=8). The interviews were audio recorded and transcribed verbatim. An applied thematic analysis approach was conducted to create memos, inductively generate a codebook, apply codes to the transcripts, and identify key themes in data.

Results

Themes emerged around barriers in the screening and referral process and also opportunities to address them. The most prevalent patient-identified barrier was the cost associated with attending the primary care visit, transportation to/from the visit, or for the PrEP prescription itself. Other patient-identified barriers included uncomfortable experiences with providers, lack of knowledge on PrEP, and the logistical challenges of attending both a screening appointment then a second PrEP appointment. The providers (doctors, nurses, medical assistants, and front-desk staff) identified additional barriers such as timing when addressing patient concerns and discussing PrEP eligibility and a need for more training/information on the pilot study and PrEP itself.

Conclusion

By addressing the barriers with opportunities such as creating a "one-stop shop" for screening and providing PrEP in primary care and encouraging the use of electronic questionnaires to immediately flag down responses indicating a person is at risk for acquiring HIV, there is a potential to increase PrEP uptake in primary care settings.

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462 3:00 pm Q

Intergenerational Reproductive Health Communication Among Salvadoran Mother and Daughter Dyads

Melissa Vasquez Rosales, Masters of Public Health / Masters in Latin American Studies (M)

Latina fertility is part of a historical political debate that has contemporarily shaped social policies around reproductive health. Yet correlates between different ethnic migration experiences of Latinas is understudied and homogenizes the reproductive health communication among generations, leaving out the realities that shape health outcomes for Salvadoran young girls and women. This qualitative study investigates: 1) how reproductive health messages are socialized within a sociocultural and political sphere 2) how changes in socialization processes impact reproductive health outcomes. Analyses of focus groups with 15 mother and daughter dyads from the Salvadoran diaspora in Los Angeles help understand the intergenerational messages about reproductive health that exist among the ethnic community. This project identifies changes in reproductive health communication and socialization messages and experiences that alter or maintain reproductive health care messages. The findings suggest that reproductive health communication and knowledge management is shaped by generational experiences in where socialization for health care seeking practices are influenced by migration and mass media. In addition, findings explore the elements of socialization around reproductive health communication when forced displacement, trauma from war and multi-border migration experiences are considered.

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463 3:00 pm R

Smoking-Related Health Risks Among Arab Americans in California

Merna Nissan, Biology (U)

Background: Arab Americans are a growing immigrant population in the United States with high rates of tobacco use. Through a literature review, our research has focused on better understanding the smoking behavior and the overall health of Arab Americans in California.

Methods: For this study, Arab Americans are defined as immigrants or children of immigrants of the 22 Arab League Countries. To obtain data, we used Google Scholar, PubMed, and the SDSU databases to find our literature pertaining to the smoking and recreational tobacco use habits of Arab Americans in California.

Results: Our findings suggest Arab American men are more likely to smoke both cigarettes and hookah compared to Arab American women (Azar 2008). Research also supports the premise that tobacco use is culturally accepted in some instances, and initiation typically begins at a young age, with 37.8% of Arab Americans reporting that they first tried hookah use before the age of 18 in one study (Kassem et al. 2015). Some research was conducted on acculturation and its effect on smoking behaviors, but the findings seem to be inconclusive. High rates of tobacco use likely contribute to the observed high rates of hypertension, diabetes, and obesity in Arab American communities. Among Arab Americans in California, hypertension rates are observed to be between 13% to 55%, diabetes prevalence rates are observed to be between 11.1% to 21.7%, and obesity is predicted to be 42. 4%. These rates are higher than the national prevalence rates of hypertension, diabetes, and obesity.

Conclusions: While research on cancer prevalence among Arab Americans is sparse, smoking has been linked to lung cancer and many other types of cancers. However, improving health education, specifically cancer-related health education, and broadening resources to support smoking cessation are possible solutions to decreasing tobacco use in Arab American communities.

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464 3:00 pm S

Goal Setting Theory in a Digital Setting

Elizabeth Springer, Psychology (U)

Goal-setting theory can be used in a variety of settings. Whether that be weight loss or daily productivity, goal-setting can be utilized to help someone reach a desired state. Goal-setting theory can be summarized regarding the effectiveness of specific, difficult goals, the relationship of goals to affect, as well as the relation of goals to self-efficacy (Locke & Latham, 2006). The theory emphasizes the importance between goals and performance (Lunenburg, 2011). The more challenging the goal, the higher the performance. The strictness of the goal-setting is more effective than encouraging one to do their best. (Klotz, 2012). In today's world, more work is being done virtually. With this being said, goal-setting has been shown to be a beneficial tool. Integrating goal-setting in a virtual environment has been shown to go smoothly and it is encouraged that more research should be done in order for leaders to adjust to the virtual climate (Ojala, 2021). The research in this paper specifically focuses on goal-setting and social media. The research question is: How do components of the goal-setting theory affect one's social media image? It is obvious that social media has become a major part of our modern lives. It is now how one can portray themselves to the world. It is not only friends and family who look at social media pages anymore. Social media has gained more attention amongst individuals and organizations (Ravaonorohanta & Sayumwe, 2020). It is common that professionals and potential employers search for the social media of candidates. That is why there is a newfound emphasis on maintaining a respectable image online. Even if one does not have social media, they should consider joining online. In some cases, it could be just as bad to have no presence online than an undesirable presence (Karampela, 2020). One can use goal-setting to change their personal image online. By setting specific, attainable goals, one can boost their online image. These goals could include increasing the amount of time active online or a complete rebranding.

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465 3:00 pm T

TiO2 protected NIFe catalyst for stable water and glycerol oxidation

Alexia Reyes, chemistry (U)

Hydrogen gas as a greener alternative to fossil fuel has become common knowledge, but to generate hydrogen through electrolysis the sluggish oxygen evolution reaction (OER) must be overcome. To drive this complementary reaction this work has focused on optimization of an excellent well understood Nickel-Iron layered double hydroxide NiFe LDH. Herein a facile method was employed to grow a thin film NiFe-LDH on a nickel foam support with an overpotential near 350 mV to generate 10mA cm-2. NiFe-LDH-nickel foam was characterized with XRD, Raman spectroscopy, and electrochemical methods. Unfortunately, the NiFe LDH is unstable overextended periods of time and non-basic conditions. In this work atomic layer deposition (ALD) of titanium dioxide was employed to improve the chemical stability and durability of the NiFe double layered hydroxides for the OER in basic and near neutral conditions. Coating the catalyst with TiO2 with thicknesses of 2.5nm, 5.0nm, and 7.5nm improved the catalysts stability in near

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neutral conditions with only a marginal loss in this OER activity. In addition to OER the electrochemical oxidation of Glycerol to formate was investigated. The organic products were quantified with NMR spectroscopy. The Glycerol oxidation reaction can similarly be coupled with the hydrogen evolution reaction to generate value added organic molecules in addition to hydrogen gas as a renewable fuel source.

Session I-4

Poster Biological and Agricultural Sciences 13
Friday, March 4, 2022, 3:00 pm
Location: Montezuma Hall

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466 3:00 pm U

Analysis of β-glucuronidase, β-galactosidase, and α-galactosidase on eight bacteria

Shawn Ogden, Cell and Molecular Biology (M)

β-glucuronidase, β-galactosidase, and α-galactosidase are all sugar transfer molecules that are found in various bacteria in the gut microbiome. These molecules have differing activity levels that are dependent on the bacteria. These molecules can conjugate sex steroids which has an overall effect on the gut microbiome composition. There is little known about the phylogenetic relationship between β-glucuronidase, β-galactosidase, and α-galactosidase in gut microbiota. The purpose of this project is to compare protein sequences for β-glucuronidase, β-galactosidase, and α-galactosidase in eight gut bacteria to better understand the phylogenetic relationship of these molecules. Using Uniprot and NCBI, β-glucuronidase, β-galactosidase, and α-galactosidase were analyzed in Faecalibacterium prausnitzii, Clostridium hathewayi, Ruminococcus gnavus, Marvinbryantia Formatexigens, Bacteroides vulgatus, Bacteroides ovatus, Bacteroides caccae, and Escherichia coli. To further investigate these proteins, a series of bioinformatic methods were used and a short literature review was conducted. A phylogenetic analysis and boxshade plot were curated to visualize the similarities of the twenty-two proteins. Crystal structures, domain structures, and genome structures were used to visualize physiological, biochemical, and functional changes of these proteins. Interpro, EnsembleBacteria, ClustalOmega, and MEGA were used to provide bioinformatical data. Results are from either a specific protein sequence or a multiple sequence alignment of twenty-two protein sequences. A phylogenetic tree was made to compare the relationship of twenty-two protein sequences. Three of the four sequences in one clade are β-glucuronidase. The clade with the lowest set of values consists of four β-galactosidases and two β-glucuronidases. Seven of the eight α-galactosidases are clustered with a high branch value. The only protein sequence that is excluded from the α-galactosidases is E. coli, which is instead clustered closest to three β-galactosidases. There are phylogenetic and functional differences of these twenty-two sequences that are found in the gut microbiome. In future research, the phylogenetic relationships of these protein sequences may be useful for comparing the functions and evolution of proteins. Further research is needed to focus on expanding the protein differences in more bacteria for a more complete analysis.

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467 3:00 pm V

Using ChIP-seq to identify genes regulated by RelA or RelB that support ovarian cancer tumor-initiating cell (TIC) characteristics

Emily Mu, Cell & Molecular Biology (M)

Ovarian cancer is the most lethal gynecologic malignancy in the US. Although high-grade serous ovarian cancer (HGSOC) patients initially respond to chemotherapy, over 70% relapse in two years. This can be understood through ovarian cancer's pronounced heterogeneity whereby a majority of cancer cells are highly proliferative and chemosensitive and a minority of cells, termed tumor-initiating cells (TICs), are relatively quiescent and chemoresistant stem-like cells. Both are presumed to be important for tumor repopulation. We previously demonstrated that TICs exhibit an upregulation of stem cell genes and NF-βB signaling. RNA sequencing of cells grown in TIC enhancing conditions shows significantly increased expression of NF-kB genes NFKB2, RELA, and RELB, as well as stem cell genes SOX2 and ALDH1A2. Here, we are investigating the mechanism through which the NF-βB transcription factors RelA and RelB support TICs to promote relapse in ovarian cancer. RNA sequencing of shRNA knockdowns of RELA or RELB from cells grown in TIC conditions shows that RELA knockdown impacts 1415 unique genes, RELB knockdown impacts 2016 unique genes, and RELA or RELB knockdown decreases expression of 1912 shared genes. Specifically, RELA knockdown significantly decreased expression of NF-kB pathway genes (RELA, RELB, NFKB2) as well as stem cell genes CD117 and ALDH1A2. RELB knockdown significantly decreased expression of NF-kB pathway genes (RELA, RELB) as well as stem cell genes CD117, CD133, and ALDH1A2. To expand on these findings we performed ChIP-sequencing of RelA and RelB in OV90 cells cultured in TIC enhancing or adherent monolayer conditions. Our results show that both RelA and RelB bind at promoter sites for NFKBIA and NUAK1 in both conditions. In monolayer cultures RelA uniquely binds 14 different genes, including Cyclin L1, important in G0-G1 cell cycle progression. In TIC conditions, RelB uniquely binds 16 different genes, including WNT10A, important in stem cell self-renewal. Experiments are underway to validate our top hits, using siRNA knockdowns to corroborate the genes and pathways through which RelB supports self-renewal and RelA supports cell cycle progression. The ultimate goal of this project is to identify downstream pathways regulated by NF-kB that can be targeted to overcome relapse in HGSOC.

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468 3:00 pm W

β-glucuronidase activity in murine gut microbiota

Laura Sisk-Hackworth, Cell and Molecular Biology (D)

Background: The advent of next-generation sequencing facilitated the discovery of sex differences in the adult mammalian gut microbiome. However, little is known about how these sex differences develop and impact host physiology. One way that sex may affect the composition of the gut microbiome is through the amount and type of conjugated sex steroids that pass into the intestine from the liver. In the liver, the sugar alcohol, glucuronide is conjugated to sex steroids to increase their solubility for excretion. In the intestine, microbes producing β-glucuronidase deconjugate sex steroids and metabolize the glucuronide. Therefore, the host might select for gut microbes based on the amount and types of glucuronidated sex steroids present in the intestine as microbial β-glucuronidases have been reported to have different substrate specificities (eg. estrogen vs. testosterone). Question: We hypothesized that in adult mouse fecal slurries, gut microbial β-glucuronidase activity would differ by sex. We also hypothesized that β-glucuronidase activities in individual microbes would reflect the phylogenetic relationships of β-glucuronidase protein sequences from those bacteria. Methods: Here, we investigated β-glucuronidase activity in adult male and female fecal (gut) communities and individual gut microbes. 4-nitrophenyl β-D-glucuronide, which absorbs at 405 nm when deconjugated, was used to assay β-glucuronidase activity in individual microbe cultures and fecal slurries. Results: Fecal community β-glucuronidase activity did not vary significantly by sex. In individual gut microbes, β-glucuronidase activity varied by species, but did not reflect β-glucuronidase phylogenetic relationships. Conclusion and Next Steps: Next, we will determine whether puberty is associated with an increase in gut β-glucuronidase activity by testing activity in fecal slurries from normal adult mice and hypogonadal (hpg) mutant mice of the same age that have not gone through puberty. Furthermore, we will create a phylogeny of β-glucuronidase, β-galactosidase, and α-galactosidase protein sequences to determine evolutionary and functional relationships among these proteins.

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469 3:00 pm X

CRISPR screen to identify BAF subunits required for stem cell maintenance and pluripotency

Ryan McCubbin, Cell and Molecular Biology (M)

Stem cell pluripotency and lineage specification rely on tightly regulated changes in gene expression. To achieve this, chromatin remodeling complexes facilitate the dynamic rearranging of genomic architecture necessary for enhancer accessibility and transcription factor binding. BAF (mSWI/SNF) complexes are a family of multimeric chromatin remodelers that hydrolyze ATP to alter chromatin structure and define the epigenetic landscape and transcriptome through activation or repression of genomic targets. Consisting of up to 15 interchangeable subunits out of 29 total subunits encoded in the mammalian genome, BAF complexes possess diverse regulatory roles owing to the hundreds of possible combinatorial assemblies, all of which convey specific instructions to the cell. Tissue-specific and cell type-specific BAF subunit compositions regulate distinct cellular physiological processes. In embryonic stem cells (ESCs), a stage-specific BAF subunit composition (esBAF) maintains properties such as pluripotency and lineage specification. Although esBAF composition is well-characterized, the contribution of specific subunits in maintaining pluripotency and germ layer specification is not well understood. The CRISPR-Cas9 gene editing system is a powerful tool which can be used for high-throughput screening and functional characterization of specific genetic elements associated with a phenotype. In this study, we used CRISPR-mediated genetic knockouts to perturb function of individual BAF subunits in human ESCs (hESCs) and assessed their roles through negative phenotype selection. Oct4-GFP hESC line was used to identify BAF subunits required for self-renewal and RUES-GLR hESC line with fluorescent-labeled lineage-specific genes was used to identify BAF subunits required for pluripotency. FACS was used to sort out hESCs retaining stem cell-specific Oct4-GFP expression or ability to differentiate into each germ layer after in vitro differentiation. Genome-integrated sgRNA from hESCs before and after sorting was PCR-amplified and subjected to Next-Generation Sequencing (NGS) to determine which BAF subunits hindered maintenance of self-renewal and pluripotency. Because BAF subunit composition is a fundamental determinant for cell identity and function, disruption of normal BAF complex activity caused by mutations in subunits is associated with a plethora of human cancers and developmental disorders. Therefore, deeper insight into the roles of specific BAF subunits will help elucidate mechanisms underlying pathogenesis of various human diseases.

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470 3:00 pm Y

Fundamentals of Vaping-Associated Pulmonary Injury Leading to Severe Respiratory Distress

Abbie Rieder, Biology (U)

Vaping has recently emerged as a safer alternative to cigarette smoking. It has become prevalent in the last decade, especially popular among teenagers. Very little research has been done on this topic affecting millions of people who vape daily. This study uses a mouse model to induce vaping-induced pulmonary injury by the use of JUUL vape pens. Numerous pathological changes were observed after 9 weeks of mice vaping, including changes in the upper airway, lung tissue architecture, and cellular structure. Histologic studies found increased parenchyma tissue density, cellular infiltrates near airway passages, alveolar rarefaction, increased collagen deposition, and bronchial thickening with elastin fiber disruption. Significant changes to gene families coding for xenobiotic response, glycerolipid metabolic processes, and oxidative stress were found by transcriptional reprogramming. Echocardiography analysis showed moderate but significant impairment to cardiac contraction. Parameters measured by echocardiography include ejection fraction (EF), fractional shortening (FS), end-systolic left ventricular internal dimension (LVIDs), and left ventricular end-systolic volume (LV Vol S). Right ventricular chamber enlargement was also observed. These findings demonstrate both pulmonary and cardiac damage related to vaping.

471 3:00 pm Z

Anchoring Metal Halide Perovskite Nanocrystals on Single-Wall or Multi- Wall Carbon Nanotubes for CO2 Photoreduction

Cassidy McCallum, Chemistry (U)

As global energy consumption is rapidly increasing due to population and economic growth, solar fuels are becoming a reliable source of renewable energy, and the conversion of CO2 by artificial photosynthesis is an encouraging start to a solution. Inorganic nanocrystals of metal halide perovskites (MHP) have emerged as promising materials for perovskite-based photocatalysts used in solar energy conversion. These MHP nanocrystals, e.g., cesium lead bromide (CsPbBr3), are ideal for optoelectrical applications of quantum dot (QD) materials. CsPbBr3 is a candidate material for synthetic photosynthesis and CO2 reduction processes as it is photoluminescent and provides a suitable band gap energy and conduction band edge position for CO2 reduction reaction. These perovskites can be used in CO2 reduction reaction for the conversion of CO2 into CO, H2, CH4 or potentially other value-added products. MHPs, however, typically suffer from low stability, rapid recombination, and low CO2 capturing property, and thus novel MHP-based heterogeneous photocatalyst is highly desirable.

Herein, we synthesized MHP-anchored single-wall carbon nanotubes and MHP-anchored multi-wall carbon nanotubes from the in-situ formation of MHP nanocrystals. The heterostructures of both MHP- anchored carbon nanotubes are investigated by SEM, EDS, XPS, XRD, PL and IR. We demonstrated that additional charge transfer channels are created for the MHP from the introduction of carbon nanotubes, as indicated by the significant PL decay for the heterostructures compared with pristine MHP. Furthermore, the MHP-anchored MWCNT allows a 1.3-fold improvement of the CO generation rate from CO2 photoreaction.

472 3:00 pm AA

Bifunctional phosphines bearing oxygenated substituents, and their metal complexes for anti-Markovnikov addition of hydroxylic compounds to alkenes

Elguja Gojiashvili, Chemistry (D)

The many useful reactions between nonpolar and polar molecules include addition of amines, water, alcohols, and related compounds to alkynes or alkenes, adding valuable functionality and often a new chiral center, as in targets important for medicine, biochemistry, and natural products. Well-known bifunctional catalysts are those of Noyori, and related systems, which transfer hydrogen by an outer-sphere mechanism. Shvo's catalyst and the Sigman/Stoltz catalysts are other notable examples. Our group has published numerous papers on bifunctional ligands with nitrogen. Here, examples with oxygenated substituents are discussed. Computational studies done in our lab predict that OH substituents may be superior to imidazole NH ones as hydrogen-bond donors, and their conjugate bases may be better hydrogen-bond acceptors than an imidazole basic nitrogen. Thus, in this presentation we explore ligand structures with phenyl groups bearing groups ortho to P such as 2-OH, or 2-SO3-(phenol, sulfonate) and their nickel and palladium metal complexes to form catalytically viable square planar catalysts for anti-Markovnikov addition of water, alcohol, or other hydroxy substituents to alkenes.

473 3:00 pm BB

Analysis of the links between bound divalent cation and a 10 helix conformation in x-ray crystal structures of human and mouse isocitrate dehydrogenase I

Marissa Balagtas, Biochemistry (U)

Isocitrate dehydrogenase I is a cytosolic enzyme that employs the NADP+ co-factor to oxidize the metabolic intermediate isocitrate to alpha-ketoglutarate and carbon dioxide. Several mutated versions of the enzyme then employ the NADPH co-product to reduce alpha-ketoglutarate to 2-D-hydroxyglutarate, a verified oncometabolite. Some of these mutant forms of the enzyme are associated with cancers, including leukemias and glioblastomas. The enzyme functions as a homodimer with an active site that involves divalent metal co-factors.

Session I-5

Poster Engineering and Computer Science 8

Friday, March 4, 2022, 3:00 pm

Location: Montezuma Hall

474 3:00 pm CC

Impact Efficacy of Polyurea Foams for Biomechancial Applications

Yazeed Kokash, Mechanical Engineering (D)

Elastomeric polyurea foams are widely used in various areas such as sports gears, protective paddings, cushioning parts in automobiles, and packages protection. The deformation mechanism in foams depends on the base material and the geometry of the cells. These types of foam undergo large reversible deformation, including elastic cell wall buckling, where the microcellular structure recovers after the loading is removed. This research aims to explicate the performance of polyurea foams subjected to repeated impact loadings at different energies congruent with biomechanical impacts using a drop weight machine and digital image correlation technique. Specifically, foam plugs, extracted from molded sheets, are loaded at energies ranging from 1.77 J to 7.1 J by adjusting the drop height of a 723 gm weight from 250 mm to 1000 mm. The imparted and transmitted force histories are recorded while concurrently capturing the impact event using high speed photography. The force-time history signals are analyzed to quantify the severity of the impact and the ability of the foam to mitigate the impact energy. High speed photography images are correlated post-loading to extract the strain, strain rate, and the Poisson's ratio. The results of the force-time history and high speed recordings are analyzed to quantify the foam efficiency in response to multiple impact loading. The results show that the foam, regardless of the density, remained mainly elastic while exhibiting energy-dependent Poisson's effect. The outcomes of this research can be used to develop protective gears with higher energy absorption and lower weight compared to the existing state of the art.

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475 3:00 pm DD

Sensitivity Analysis of Geometric Imperfection Sources in Aluminum Honeycomb Cores on Compression Mechanical Behavior

Adrian Rivera, Structural Engineering (D)

Sandwich composites panels are low density and energy absorbing structures constructed from two facesheets bonded to a core material. A common example is corrugated cardboard used in packaging where cardboard sheets are bonded to a fluted corrugated cardboard core providing a lightweight structure that can absorb low-velocity impacts while maintaining high bending stiffness. Aluminum honeycomb sandwich panels are similarly used in aerospace structures and are constructed using thin-walled aluminum foils bonded to construct a honeycomb lattice. During manufacturing of the aluminum honeycomb, the thin metal walls are susceptible to imperfections that deviate from an ideal honeycomb shape. Imperfections in the cell walls affect the strength particularly the resistance to damage under impact loads. Computational tools to quantify imperfections and investigate their effects on quasi-static compression and impact response can inform design criteria to construct safer and lighter launch vehicle structures. Measuring manufacture induced imperfections was performed using high resolution X-ray computed tomography (CT) imaging. Image processing is used to generate mid-surfaces of the honeycomb from X-ray CT for analyzing the honeycomb with imperfections using shell finite elements (FE). The geometric imperfections are decomposed into three components shape imperfections (cell edge length and cell internal angles), in-plane cell wall waviness and out-of-plane waviness along the core thickness. A sensitivity analysis is conducted to understand how each individual components affects the compression failure of aluminum honeycomb cores. Crushing response obtained from FE analysis of the honeycomb cores show that in-plane waviness in the honeycomb core models increased compression strength and stiffening response. The inclusion of out-of-plane imperfections reduced transverse stiffness by 14.3 percent compared to models with in-plane imperfections. Traditional analysis of buckling in cellular structures use seeded imperfections from linear eigenmodes. From our results these methods are insufficient as eigenmode shapes do not introduce stochastic imperfections that can accurately capture the anisotropic compression response of honeycomb materials with manufacturing induced imperfections. Compression strength was shown to be sensitive to internal angle and length variations as well as out-of-plane waviness resulting in knockdown, while in-plane waviness introduced non-linear stiffening and interrupted plastic evolution in the cell walls.

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476 3:00 pm EE

Analysis of Ply Transition Regions in Metal/CFRP Hybrid Composite Laminates

Rommel Pineda, Aerospace Engineering Structural Mechanics (M)

The use of carbon fiber-reinforced plastic (CFRP) materials in critical load bearing aerospace structures is increasing due to their high strength and stiffness properties. Composite materials exhibit low bearing strengths which makes bolted joints critical failure regions. Metals provide high bearing strength but are heavy. Local hybridization of CFRPs with metal foils at joints to increase bearing strength, creates a transition region in between the full monolithic CFRP laminate region and the full hybrid laminate section. Designing a high performance hybrid laminate requires replacing select CFRP plies with metal plies, determining which plies are favorable to replace and modifying the stagger pattern resulting from CFRP ply replacement which promotes bearing strength. My work aims to create detailed numerical models of the transition region to investigate and understand the influence different laminate configurations have on the damage/failure mechanisms that occur within the transition region under bearing load conditions. A detailed 3D finite element model (using ABAQUS™) is developed. The analysis includes material failure models for inter/intra-ply failure. The cohesive zone method (CZM) is utilized a to model the interlaminar failure in the resin region between plies. An energy-based continuum damage mechanics (CDM) model with smeared crack damage representation and Hashin's criteria for damage initiation is used to model for intra-ply damage in fiber tension, fiber compression, matrix tension and matrix compression modes. The transition regions are analyzed under tension and bending loads. Analysis results show that transition zone experiences complex mixed-mode failure. Transverse cracking first appears at regions in the ply substitutions with the highest stiffness mismatch. This cracking leads to shear transfer of loads to neighboring plies causing interlaminar failure. Interface cracks grow along the material junction of similar stiffness. Stress redistribution after initial failure leads to progressive transverse cracking and interlaminar cracking, leading to final failure. Ongoing work is experimentally validating these models. We have created detailed high fidelity models that can accurately predict damage initiation, growth, and failure in the hybrid CFRP/Metal composite laminate transitions. Once validated, these models can be used to derive simpler models for use in design optimization.

(U) = Undergraduate; (M) = Masters; (D) = Doctoral

477 3:00 pm FF

Modeling Failure of Carbon Fiber Polymer Matrix Laminate Composites with Ply Waviness Defects

Jarod Heise, Aerospace Engineering (M)

Accurately modelling carbon composites continues to have challenges due to defects and imperfections introduced during the manufacturing process. Ply waviness defects in composites are common occurrences in parts with large thickness changes or curvatures. The waviness contributes to the decrease in axial stiffness and compressive strength. Current empirical approaches to quantify strength reduction requires extensive testing and are expensive. Mechanistic models based on understanding how the ply waviness affects the initiation, interaction, and evolution between damage modes in the carbon composite laminate are needed. This research creates high fidelity numerical models to investigate failure of laminates with defects under compression load. Three-dimensional finite element models (using ABAQUS™) of composites laminates with the detailed representation of the defects are created. The wavy plies are modelled as an idealized phase shifted sinusoidal half-wave and the material orthotropy direction specified using a user subroutine (ORIENT). Failure analysis considers interlaminar and intralaminar failure modes. The interlaminar failure is modeled using a Cohesive Zone Modelling approach. The cohesive interactions model uses a linear traction-separation continuum damage model and a quadratic stress criterion for failure initiation. The mixed-mode crack growth is modeled using the Benzeggagh-Kenane mixed-mode fracture energy criterion. The intralaminar failure uses a smeared crack, energy-based continuum damage mechanics (CDM) model with Hashin's criteria for failure initiation (implemented as a user-defined material subroutine, UMAT). The results show that damage initiates with as matrix tension in the wavy ply at the location of maximum curvature due to the bending induced. The initial damage and softening cause stress redistributions that lead to cohesive interface damage. The debonded wavy ply then suffers fiber compression damage in the wavy plies. The models qualitatively and quantitatively show good agreement to experimental observations. Future work will use developed modeling approach to investigate interaction of fiber waviness with ply waviness and parametric sensitivity studies. The developed tools and methods support the design of varying thickness laminates seen in aerospace structures.

478 3:00 pm GG

Numerical Nonlinear Analysis of Reinforced Concrete Structures

Stephania Moreno, Civil Engineering (Structural) (M)

The advancement of seismic-resistant, reduced-damage structures is reached through damage prediction and assessment from a combination of large-scale testing, numerical modeling, and design codes. Numerical modeling techniques significantly advanced in the last decades to capture salient features of the response of concrete structural elements during earthquakes. As an example, the interaction between axial/flexural and shear behavior typically observed in reinforced concrete structural walls and columns under cyclic loading can be represented with sufficient accuracy by a macro-element model (SFI-MVLEM) available in OpenSees, an open-source finite element program. However, strength and stiffness degradation and progression of damage cannot be reproduced with confidence by this numerical model. The goal of this research project is to improve the prediction of cyclic degradation, strength loss, and failure mode of reinforced concrete walls with the use of numerical programming tools. To this end, this study focuses on nonlinear analyses modeling 2D reinforced concrete panels with an advanced steel material model, the ReinforcingSteel model. This uniaxial constitutive nonlinear hysteretic material model for steel is used in reinforced concrete fiber models to represent the steel reinforcement and looks promising in capturing degradation. Preliminary results show that fatigue and strength reduction parameters have a significant influence on the degradation observed in the global load-displacement hysteresis curves of the wall model. As the buckling and fatigue attributes of the simulation are still being enhanced and refined, confidence in the ReinforcingSteel material is gained through comparison of numerical and experimental results.

479 3:00 pm HH

Developing a framework for prioritizing safety improvement projects for bicycle facilities using crowdsourced data

Amir Reza Sadeghi, Civil Engineering (Transportation Engineering) (M)

During the last decade, non-motorized modes of transportation, including cycling and walking, have been spreading as they are considered economical, eco-friendly, and energy-efficient. With the expansion of active transportation, statistics show a significant increase in the number of fatalities. Between 2010 and 2019, there was a 36 percent increase in bicycle deaths in the United States. Moreover, despite the 41 percent drop in traffic volume in response to spring lockdowns caused by the Covid-19 pandemic, 697 bicyclists lost their lives in crashes in 2020, and California with 118 fatalities was the deadliest state for bicyclists. In this project, we propose to develop a crash-risk scoring method for prioritizing Bicycle safety improvement projects in the county of San Diego. Caltrans has a great interest in this topic as many bicycle bridges need to be improved to meet new standards. The prioritization methodology will have a widespread applicability and can be adopted by Caltrans for similar projects. The majority of the studies on pedestrian and bicycle safety suffered from the limitation of the exposure data as they relied on traditional data collection methods. In this project, we will use a combination of traditional data (e.g., historical crash data, environment characteristics) and crowdsourced data (e.g., STRAVA, StreetLight data) in order to develop a robust model to identify high-risk locations. Since crowdsourced data could be biased towards males and more athletic people, we will investigate and utilize calibration methods to address this issue. Moreover, previous studies show a disproportionate bicycle crash distribution among people with different Socio-demographic characteristics. We will investigate transportation equity factors to include in the proposed risk scoring method to account for social justice across all communities.

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480 3:00 pm II

Fuel-Optimal Powered Descent for Human Mars Missions

Kaylin Borders, Aerospace Engineering (U)

Crewed missions to Mars are what NASA and private space companies and government agencies are looking forward to in the future. Taking humans to places beyond where we as a civilization have been before, is a dream that is sure to become a reality in the next ten years. But in order to successfully land humans on Mars more research needs to be done in regard to the entry, descent, and landing phase (EDL) once a spacecraft has reached the Martian atmosphere. Specifically, regarding descent, the powered descent phase is one during which retrorocket propulsion is used to slow down the lander, and this phase has proven to be very critical to mission success and crew safety. Yet using as little as possible propellant during powered descent has not been at the forefront of the robotic missions at Mars and Apollo program for landing on the Moon, it is very critical for a human-scale Mars mission. This project will focus on finding the optimal powered descent trajectory that uses the least amount of propellant. This will be done by using a trajectory optimization software to find fuel-optimal powered descent trajectories, first starting from a one-dimensional case, then progressing to a three-dimensional model. The solutions will provide a good understanding of the optimal powered descent trajectories, and establish benchmarks and verification for mission planning and analysis.

Session I-6

Poster Physical and Mathematical Sciences 6
Friday, March 4, 2022, 3:00 pm
Location: Montezuma Hall

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481 3:00 pm JJ

Investigation of the Mechanism of Growth of Silver Nanoparticles through Determination of Chemical Intermediates

Jenna Mulligan, Chemistry (U)

Silver nanoparticles have grown increasingly popular in research and commercial applications, primarily due to their antimicrobial effects and remarkable optical properties. Despite their popularity, the reaction pathway of the synthesis of silver nanoparticles is not yet fully known, and moreover, the final properties (e.g., size distribution) of the nanoparticles often show an unexpected variability. The purpose of this project is to determine the mechanism of growth by identifying chemical intermediates that are present during the growth. Knowledge of the mechanism will suggest changes to the reaction conditions and thus help optimize the synthesis.

The synthesis is carried out in water and utilizes sodium borohydride to reduce silver ions in the presence of citrate ions, which cap the nanoparticles and stabilize them. To analyze the reaction dynamics during the synthesis, a fast UV-Visible absorption spectrophotometer with 10 msec time resolution is used to monitor the progress of the reaction. Alongside data analysis, the electronic structure program, Gaussian, is used to model the UV-Visible spectra of silver compounds in order to help assign the peaks observed in the spectra.

Thus far, a peak at 230 nm at early times (< 100 msec) has been detected in the UV-Visible spectra. The species that gives rise to the peak is unknown, and Gaussian computations are being used in order to predict the unknown compound's identity. The results of the UV-Visible spectra taken as a function of time during the silver nanoparticle synthesis along with potential compounds for the identity of the unknown peak will be presented.

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482 3:00 pm KK

Kinetic characterization of Human DNA Polymerase ε

Isaac Marquez, Biochemistry (M)

DNA polymerases are necessary for the efficient and accurate replication of the entire genome and its stability. Human DNA polymerase ε (Pol ε) is responsible for the highly processive, highly accurate DNA replication of the leading strand of DNA. Its high fidelity is due to a combination of intrinsic base selectivity and proofreading exonuclease activity. When coupled with post-replication DNA repair pathways, Pol ε has a mutation rate of about 1 error per 109 base pairs. When somatic mutations develop in Pol ε , this can lead to a hypermutation phenotype that can lead to cancer. Some cancer types that are driven by Pol ε mutations are melanoma, stomach adenocarcinoma and, most commonly, endometrial carcinoma. Currently, we don't know how these mutations found in cancer affect the kinetics of Pol ε incorporation and fidelity. We hypothesize that the cancer mutants lead to decreased fidelity and decreased rates of nucleotide incorporation. First, however, we need to characterize wild type (WT) Pol ε to provide a baseline for comparison with mutant kinetics. Our scientific approach to address the effect on kinetics and fidelity of Pol ε is by utilizing a truncated but still active form of the enzyme to improve heterologous expression and purification. We will then use pre-steady state kinetics experiments to characterize the catalytic parameters of both the exonuclease and polymerase domain in Pol ε mutants to measure nucleotide incorporation rates, incorporation fidelity, and rates of excision repair of nucleotide mismatches. This study can help to identify tumor-driving mutants of Pol ε mutants reported in tumors.

483 3:00 pm LL

Connecting Searches to Scorches: Evaluating how people across California interact with the topics of wildfire and air quality through Google searches

Elizabeth Mayes, Geography (M)

Understanding the drivers and dynamics of public interest wildfires is crucial to determining effective outreach and education strategies for wildfire mitigation, prevention and fuels management practices. Surveys quantifying perceived concern or risk-perception in communities are one way to obtain this information, however, limited support in funding or staff to conduct surveys, in addition to low response rates, may limit the scope of such studies and our understanding of public wildfire concern to only a few small areas or regions. In California, much of the state is susceptible to impacts from wildfires, and while burns may occur more frequently in some regions than others, wildfire smoke can travel far distances- sometimes hundreds of miles- affecting multiple communities. As state-wide surveys may be difficult to conduct, the use of large-scale, publicly available datasets such as Google search term data may be valuable in evaluating wildfire concern across California. In this study, we employed a big data science approach to determine whether the timing of Google searches for wildfire-related terms (as a proxy for public wildfire concern) varied significantly between different regions in California, and whether measurements of wildfire intensity had an effect on public concern. We performed hierarchical clustering analyses and linear mixed effects modeling using data from Google Trends, the EPA air quality monitoring program, and CAL Fire over a 16- year time period. Our results indicated that while the timing of wildfire-related searches did not vary significantly between regions of California, the region, amount of burn area, and air quality index value were all significant predictors of wildfire concern. This information on the drivers of public wildfire concern and interest may be useful to managers wishing to design an education and prevention campaign that more effectively resonates with the public.

484 3:00 pm MM

Identifying active sites on Co3O4 electrocatalyst during the glycerol oxidation through in situ Raman spectroscopy

Gonto Johns, Chemistry (M)

Currently our planet is at a tipping point, facing the direct impact of human caused climate change and ecological pollution. It is imperative to identify alternative means to advance sustainable and renewable energy. The electrochemical splitting of water to generate hydrogen and oxygen is a promising route, however, faces limitations by the sluggish kinetics for the oxygen evolution reaction (OER). Fortunately, this can be circumvented by replacing the OER by small organic molecules oxidation, such as glycerol oxidation which require a smaller energy input than water. Current studies focus on pinpointing optimal catalysts that can minimize the energy required to drive those reactions. However, limited work has conducted on the identification of the catalytic active sites that drive those reactions. Herein, we plan to use Co3O4 deposited onto carbon filter paper (CFP) to act as catalysts, capable of selectively oxidizing ethylene glycol to formate. To identify changes to the catalyst during the catalytic process, in-situ Raman spectroscopy will be utilized to observe changes in structure of the catalysts. The identification of active sites will provide unprecedented information of how the reaction proceeds and allow for the rational design of future advanced catalysts.

485 3:00 pm NN

Downscaling Southern California's Future Climate

William Nicewonger, Geography (U)

The climate change information required for many impact studies is of a spatial scale much finer than that provided by general circulation models (GCMs). This is especially true for regions of complex topography, coastal locations, and highly mixed land cover areas like that of the Southern California region. GCMs have resolutions of hundreds of kilometers which have limited capabilities when planning mitigation strategies for a changing climate. This project uses statistical downscaling to increase the resolution from 100 x 100km to 4 x 4km per pixel. It aims to create a host of programming scripts to downscale GCM outputs and analyze the future morning and afternoon temperatures for the Southern California region. Morning and afternoon temperatures are essential because they represent the average lowest and highest temperatures of the day, which are critical for forecasting changes to the coastal marine layer and increased energy usage. Geographically knowing where temperatures will increase and by how much will assist city planners in implementing mitigations to combat the challenges associated with climate change.

486 3:00 pm OO

Investigating The Unique Light-curve of Nova Her 2021

Madeline Overton, Astronomy (U)

Novae are some of the most common transient events we see across the universe. Although these outbursts are not the most violent events, they still have a significant role in shaping their environments and act as a laboratory for a large range of physics and astronomy. We present the advanced photometry of Nova Her 2021 (V1674 Her) obtained from observations from Evryscope and the Mount Laguna Observatory All-Sky Camera. Previous work revealed an unexpected plateau in the pre maximum light curve approximately 8 magnitudes below peak brightness. This poster presents the point spread function (PSF) fitting photometry which examines the presence of a plateau, as well as the tests we performed to verify the accuracy of the PSF-fitting. We discuss the deviations of this plateau's characteristics from the more commonly observed feature: a pre maximum halt. The results of this work may be used to investigate the physical processes behind the plateau.

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487 3:00 pm PP

Lithium Extraction from Geothermal Brine via Indirect Capillary Zone Electrophoresis

Savannah Orth, Chemistry (U)

The demand for lithium batteries is growing rapidly and is outstripping the capacity of traditional mines. One environmentally promising alternative is geothermal brines high-temperature highly saline matrices found in underground reservoirs. Lithium is not present as the most abundant cation in the majority of geothermal brines, with other cations such as potassium, calcium, and sodium appearing in much larger concentrations. Therefore, these extraneous cations must be removed to obtain pure lithium. In particular, this project is evaluating the performance of XE-832 aluminum-lithium sorbent by DOW to extract lithium via quantification of effluents during the lithium extraction and recovery process.

The collection of lithium from geothermal brines is complicated by the presence of much higher concentrations of common soluble ions (e.g. Na+, K+, and Ca2+), as well as less common ions which become insoluble in the presence of atmospheric oxygen and higher pH environments (i.e. Fe2+). To be used on a commercial scale, it is important to evaluate the performance limits of the lithium sorbent under a range of conditions. To that end, this work will evaluate the efficacy of the sorbent to collect and recover lithium from both simple lithium chloride solutions to more complex solutions that contain a range of salts in much greater concentration than the lithium. We will also evaluate the kinetics of the capture process to evaluate how quickly the solution may be transported over the sorbent while effectively recovering the lithium.

The analysis of the efficacy of the capture and release from the sorbent will be affected with capillary zone electrophoresis. This technique allows us to separate and quantify all cations in the effluent from the extraction column in single separation. However, the wide range of concentrations of cations in the mixtures does necessitate some modifications to our separation and detection process, which will be presented as well.

Abstracts of Presentations

Session J and K

San Diego State University

Session J-1

Creative Arts Exhibits
Friday, March 4, 2022, 9:00 am
Location: Montezuma Hall

488 9:05 am

Intuitive Recycling: Importance of waste receptacle design & application

Joshua Tanida, Multimedia (U)

Sustainability is an issue communities across the country are realizing must be addressed at all levels, from the individual to institutions. Western countries, especially the United States, create a majority of global waste pollution and must start implementing effective practices to recover as much usable material from waste. A popular sustainability hierarchy, from most preferred to least, begins with 1. refusing unsustainable practices, 2. reducing or minimizing resource use, 3. recycling, 4. material recovery, and 5. final disposal.

United States, as one of top producers of global waste, has one of the worst rates of recycling compared to similar developed nations. The consensus is that the United States does not mandate effective national recycling programs. According to the U.S. EPA American recycling rates in 2019 were 32% of all municipal solid waste(MSW), compare to Germany's 66% recycling rate. A main reason for America's substandard recycling performance is the fact that a majority of recycling programs in the United States cause recyclable items to be mixed with/and/or contaminated by other sources of waste. This contamination of American recyclables is linked directly to the way Americans sort recyclables from waste and even recyclables from other recyclable materials.

Germany, Sweden, and Japan are countries with some of the highest rates of recycling and have designed and implemented stringent recycling guidelines and regulations. Regulations and guidelines aside, a significant reason why recycling works in these countries is the fact that they all have specifically designed, intuitive, public recycling receptacles and repositories that clearly delineate how to properly recycle items that an individual may encounter. Increasing the rates of recycling in America is imperative for the sustainability movement and the first issue, and possibly the most important, is to rethink and redesign our system of waste disposal. Through research we identified various features in receptacle design that have been successfully adopted and we are using these features to design effective recycling receptacles for domestic use.

489 9:20 am

American Hero

Alexander Zimmerman, Master of Fine Arts (M)

The Internet and social media have become powerful platforms for learning about political

issues, and coordinating action. Social mobilization and online activism, combined with creative artistic tools and digital media technologies allow individuals to contribute to the political discourse. My recent body of work, entitled 'American Hero' investigates the idea of individualized collective action. Covid-19, the murder of George Floyd, and the presidential election were the most significant events that played a big role in this body of work.

I utilize social media platforms, such as Instagram and YouTube to engage various audiences in dialogue on equity, access, and social justice. Art has always played a role in social justice movements. Political art provides and promote increased awareness and create a framework for people to have necessary conversations with each other. This is at the core of my practice and research.

Session K-1

Creative Arts Presentations
Friday, March 4, 2022, 11:00 am
Location: Montezuma Theater

490 11:05 am

Latinas in San Diego Informal economies during the COVID-19 pandemic

Nancy Bahena, Women's Studies (M)

This storytelling, community informed, short-film project seeks to narrow the gap in the feminist intersectional documentation of low-income Latina's participation with informal economies (unregulated labor) from Central and South San Diego during the COVID-19 pandemic. The collaborative project will expand beyond the scope of monetary sustenance and build upon how their labor shapes and influences the dynamics these informal businesses create for the participants personally, in familial relations, and their communities. This film will also dive upon how through a critical time period the participants persevered, as well as found solutions, community, and joy, in the midst of social unrest, economic downturn, political transitions, and a deadly pandemic. In addition, it will share perspectives of what community members and consumers can do to better understand their labor, demystify unregulated labor, and how to better support small entrepreneurship through the improvement of current work attitudes and policies to spark incremental change. Lastly, this film also aims to add towards Latina/Chicana informal labor visibility in San Diego as currently no formal archive or film exists that confirms their existence nor in-depth description of the dynamics they experience in San Diego County. *This film will be in Spanish with English subtitles as a way to elevate the language that the participants/collaborators and I first learned and grew up with. Due to the sensitive nature of the film material and to preserve the safety of other collaborators/participants in it, some pseudonyms will be used (preferred names to to be chosen and determined soon by participants/collaborators).

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Acknowledgements

Our thanks and appreciation to the following individuals, units and groups for their support of student involvement in research, scholarship and creative activities.

Administration

Adela de la Torre, President
Hector Ochoa, Provost and Senior Vice President
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A special thanks to the rest of the Division of Research and Innovation in helping make this event possible.

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