MCNAIR RESEARCH CONFERENCE

OCTOBER 1-2, 2020

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WELCOME

FROM OUR DIRECTOR

I am delighted to welcome you to the Annual McNair Scholars Research Conference hosted by Baylor University and the Baylor McNair Scholars Program. Baylor University aspires to transform lives around the world through ground-breaking research and evidence-based, capacity-building partnerships that address the critical issues of our time and create a foundation for future discoveries.

The Baylor McNair Program, as part of the Paul L. Foster Success Center at Baylor University, is an integral part of providing Baylor undergraduate students with a truly transformational education through undergraduate research, access and opportunities. The program aims to prepare undergraduate students from low-income, first generation and underrepresented backgrounds in acquiring the knowledge, skills and capacities necessary to successfully navigate a path to a Ph.D. program following graduation from Baylor. I encourage all undergraduate attendees to consider Baylor University for their graduate studies.

This year's Baylor McNair Scholars Research Conference is packed with outstanding speakers, workshops, panelist, and student presenters ranging from a wide variety of disciplines. With more than 40 universities from across the U.S. represented, I am confident that this will be an unforgettable experience for every participant! On behalf of the Baylor McNair Scholars Program and Baylor University, I would like to once again extend our most heartfelt welcome and wish you an enjoyable and inspiring conference experience.

Sincerely,



Steven Fernandez
Ronald E. McNair Post-Baccalaureate Achievement Program, Director
Baylor University | Paul L. Foster Success Center
baylor.edu/mcnairscholars

CONFERENCE SCHEDULE

THURSDAY, OCTOBER 1

TIME	EVENT
10:00 - 10:45 a.m.	Welcome & Keynote
11:00 a.m. - 12:00 p.m.	Presentation Session 1
12:15 - 1:15 p.m.	Presentation Session 2
1:30 - 2:30 p.m.	Lunch/Baylor Graduate Student Panel/Fellowship Info
2:45 - 3:45 p.m.	Presentation Session 3
4:00 - 5:00 p.m.	Presentation Session 4
5:15- 6:15 p.m.	Networking Hour/McNair Staff Meeting

FRIDAY, OCTOBER 2

TIME	EVENT
10:00 - 10:30 a.m.	Keynote
10:30 - 11:30 a.m.	Workshop/Presentation Session 5
11:45 a.m. - 12:45 p.m.	Workshop/Presentation Session 6
12:45- 1:00 p.m.	Announcements
1:00 - 5:00 p.m.	Graduate School Fair

KEYNOTE SPEAKERS



Malcolm Foley, Baylor University

Malcolm Foley serves as the Special Advisor to the President for Equity and Campus Engagement. In this joint role, Mr. Foley facilitates engagement and interaction with and among the many diverse members of our community and works collaboratively to develop initiatives designed to foster a welcoming and inclusive campus for all.

Mr. Foley holds a B.A. in Religious Studies with a second major in Finance and a minor in Classics from Washington University in St. Louis. He then completed a Master of Divinity at Yale Divinity School, focusing on the theology of the early and medieval church. Mr. Foley is currently a sixth-year Ph.D. student in Baylor's Department of Religion studying the history of Christianity. His dissertation investigates African American Protestants responding to lynching from the late 19th century to the early 20th century. From 2018-2020, Mr. Foley served as a student regent on the Baylor University Board of Regents. He is the Director of Black Church Studies at George W. Truett Theological Seminary and the director of discipleship at Mosaic Waco, where he serves with his wife, Desiree.



Dr. Mia Moody-Ramirez, Baylor University

Mia Moody-Ramirez, Ph.D., is Professor and Chair of the Baylor University Department of Journalism, Public Relations and New Media. She joined Baylor in 2001 and has maintained an active research portfolio in addition to her teaching and leadership roles. Her research emphasizes media framing of people of color, women and other underrepresented groups.

The author or co-author of four books, Dr. Moody-Ramirez has also been widely published in a variety of academic and industry journals. She was honored with the Outstanding Woman in Journalism award by the Association for Education in Journalism and Mass Communication, and this summer received the organization's Lionel Barrow Jr. Award for Distinguished Achievement in Diversity Research and Education. She is also a 2019 Fellow in the AEJMC Institute for Diverse Leadership.

WORKSHOP SPEAKERS



Jarron Decker

Strategies for Competitive Graduate Applications in STEM Fields

Rensselaer Polytechnic Institute

Jarron Decker is the Director of Graduate Admissions at Rensselaer Polytechnic Institute (RPI), the nation's oldest technological research university. Following a career in child welfare where he helped support high school students transition to undergraduate programs, he has been employed with Rensselaer since 2007. Jarron is primarily responsible for the recruitment of under-represented students in STEM fields, and is a regular attendee at McNair conferences across the country. In addition, he presents to student groups at numerous colleges and universities, and is a regular graduate school panelist at the United States Department of Energy's Science Undergraduate Laboratory Internship program at Brookhaven National Laboratory.



Peter Le

Funding, Expectations, and Outcomes for Graduate School

The University of Texas at Arlington

Peter Le currently serves as a graduate recruiter at The University of Texas at Arlington. He graduated with his bachelor's degree in economics and is currently pursuing his master's in educational leadership. Peter started his career in 2013 in higher education as a student worker, and later transitioned into financial aid and student accounts prior to recruitment. Peter hopes to connect with future graduate students, to share his experiences in graduate school as it pertains to funding opportunities, expectations and outcomes.



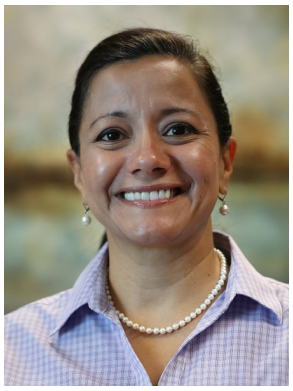
Lindsey Weglarz

Personal Statement Writing

University of Chicago

Lindsey Weglarz is the Assistant Director for Graduate Enrollment Initiatives at the University of Chicago. She holds a master's degree and Ph.D. in Egyptian Archaeology from University of Chicago and has worked in graduate admissions for 6 years.

BAYLOR GRADUATE PANEL



Rizalia Klausmeyer, Ph.D. (Moderator)
Director of Undergraduate Research
Director Science Research Fellows

Dr. Klausmeyerwas born and raised in Puerto Rico. She received a B.S. in Chemistry from University of Puerto Rico in 1991 and a Ph.D. in Chemistry from Texas A&M in College Station in 1996. She became the Director of Freshmen Labs at the University of Illinois in Urbana-Champaign in 1997. In 2000, she moved to Waco with the other Dr. Klausmeyer, and started teaching general chemistry, organic chemistry at Baylor, and taking care of their three daughters. In 2013, she took a chance and became the Associate Director of the Prehealth Office, and in 2018 was named Director of Undergraduate Research.



Ted Cockle
Ph.D. Candidate, Higher Education Studies and Leadership

Ted is a fourth-year doctoral student whose research explores student pathways, moral identity, and Christ-enlivened education. He earned his B.A. and M.A. degrees from Wheaton College (IL) before serving as the Assistant Director of Wheaton's student activities office. Ted also serves as the editor of Ideas, an online publication of the Association of Christians in Student Development (ACSD), and is co-author of Christ-Enlivened Student Affairs: A Guide to Christian Thinking and Practice in the Field. When he is not reading or writing, Ted and his wife Kate enjoy spending time outside and reading to their three boys.



David Narvaiz
Ph.D. Student, Psychology and Neuroscience

David Narvaiz is a Texas Army National Guard veteran who served in Kosovo and Iraq. David started attending Lamar University (LU) in 2014 for his undergraduate degree in biology while he continued to serve in the National Guard and working as a paramedic. He is a McNair scholar and recipient of two travel awards to present research posters. He has presented research at Penn State's Life Science Symposium and the Diversity in STEM conference hosted by the Society for the Advancement of Chicanos/Hispanics and Native Americans in Science. David was awarded the Diversity in Health Research

Grant by the National Institute of Neurological Disorders and Stroke. He is currently pursuing his Ph.D. in psychology and neuroscience, researching the neurological and behavioral consequences of seizures during development under the advisement of Dr. Joaquin Lugo. David enjoys nearly anything, so long as he gets to do it with his wife and two little girls.



Kendall Scarlett

Ph.D. Student, Environmental Science

Kendall is a third year PhD Student in Environmental Science with a strong passion for environmental toxicology and water quality. Her research involves understanding how natural toxins (specifically Cylindrospermopsin) produced from harmful algal blooms effect wildlife and human health around the globe. She received her M.S. in Zoology from Oklahoma State University in 2018 and her B.S. in Biological Science from Florida State University in 2014. Kendall advocates for graduate and professional students with the help of NAGPS (National Association Graduate-Professional Students) along with serving as the Director of Administration for the organization. In addition, she currently serves as the Executive Vice President for BU's Graduate Student Association and is still actively involved in mentoring ladies as an alumnae and advisor for BU's chapter of Alpha Chi Omega. When not in school or in meetings, Kendall enjoys anything and everything true crime related, board games, and baking.



Aadil Sheikh

Ph.D. Student, Biology

Aadil is a third-year Ph.D. student and completed his undergraduate studies at Baylor University. He received his M.A. in Biology in 2018 and his B.S. in Biology in 2017. Aadil focuses his research on colon cancer and the influence of bacterial particles on immune responses. He is also passionate about graduate student support and advocates for his peers as a departmental representative to the Graduate Student Association. Whenever he is not in lab, Aadil enjoys reading, watching Netflix and working as a photographer for Baylor Marketing.

GRADUATE NETWORKING

5:15 - 6:15 P.M.

GRADUATE PROGRAM DIRECTOR ROOM

Dr. Nicolas Benson
Associate Professor of Educational Psychology

Dr. Gerald Cleaver
Professor of Physics

Dr. Kevin Dougherty
Associate Professor of Sociology

Dr. Christine Limbers
Associate Professor of Physics

Dr. Joaquin Lugo
Associate Professor of Psychology and Neuroscience

Dr. Mark Sepanski
Professor of Mathematics

Dr. Kevin Shuford
Professor of Chemistry

Dr. Joseph Stubenrauch
Associate Professor of History

Dr. Tony Talbert
Professor of Social/Cultural Studies Education and Qualitative Research Department of Curriculum and Instruction

Dr. Joseph Taube
Assistant Professor of Biology

NETWORKING HOUR

Hina Abel
Ph.D. Student, Higher Education Studiesand Leadership

Alonso Aravena Mendez
Ph.D. Student, Sociology

Jacqueline Carroll
Ph.D. Student, Biology

Malcolm Foley
Ph.D. Student, Religion and Special Advisor to the President for Equity and Campus Engagement

Katherine Goodwin
Ph.D. Student, History

Elijah Jeong
Ph.D. Candidate, Higher Education Studies and Leadership

Shelby Rivers
Ph.D. Candidate, Psychology and Neuroscience

Andrew Sutherland
Ph.D. Student, Religion

Alexandra Tyra
Ph.D. Student, Psychology and Neuroscience

ORAL PRESENTATION SCHEDULE

THURSDAY, OCTOBER 1

	ROOM	PRESENTATION
11:00 a.m. - 12:00 p.m.	**1**	**Gabriella Diaz, St. Lawrence University** How Does the Psychological Sense of Community for International Students Become Disrupted During a Crisis?
11:00 a.m. - 12:00 p.m.	**1**	**Odalis Garcia, University of North Texas** Bidirectional association of daily stress and nightmares
11:00 a.m. - 12:00 p.m.	**1**	**Destiny Nicoll, St. Edward's University** Assessing Compassion Fatigue Amongst Social Workers in the Child Welfare System
11:00 a.m. - 12:00 p.m.	**2**	**Jada Childs, Eastern Michigan University** Effect of Stress on Health of African American Women in Low Income Neighborhoods
11:00 a.m. - 12:00 p.m.	**2**	**Sarah Hale, Baylor University** Authenticity and Virtue in Political Discourse
11:00 a.m. - 12:00 p.m.	**2**	**Zara Taylor, East Tennessee State University** The Role of Objectification and Minority Stress in Disordered Eating Among Transgender Women on Highly Visual Social Media Sites: A Mediational Model
11:00 a.m. - 12:00 p.m.	**3**	**Tatiana Bakken, University of Wisconsin - Stout** Cultural Competence among Psychology Trainees: An Examination of the Cultural Knowledge and Awareness in Psychology Students at the Start of their Internship Year
11:00 a.m. - 12:00 p.m.	**3**	**Brandon Pitts, The University of Kasnas** The role of APOE Îµ4 in Executive Function, Verbal Memory, and Attention in Participants With and Without Mild Alzheimer's Disease
11:00 a.m. - 12:00 p.m.	**3**	**Arlen Rodriguez Varela, The University of Texas at Austin** Considering the Immigrant Civic Potential: Latinx Immigrant-origin Youths' Civic Identity Development Prior to the 2020 Election
11:00 a.m. - 12:00 p.m.	**4**	**Taleah Frazier, University of North Carolina - Chapel Hill** Associations Among John Henryism Active Coping and the Mental and Physical Health of African American Women: A Scoping Review
11:00 a.m. - 12:00 p.m.	**4**	**Jasmine Jackson, Harding University** Pediatric Bullying Education in Baccalaureate Nursing Programs in Arkansas

11:00 a.m. - 12:00 p.m.	**4**	**Ashlyn Werner, University of Wisconsin - River Falls** The Connection Between Mental Illness and Stuttering
11:00 a.m. - 12:00 p.m.	**5**	**Savannah Anderson-Knight, The University of Texas at Austin** I'm Not One of Your Little Friends
11:00 a.m. - 12:00 p.m.	**5**	**Eliana Flores, West Texas A&M University** 19th and 20th Century Mexican Identity: Expressing Gender and Culture Through the Arts
11:00 a.m. - 12:00 p.m.	**5**	**Danielle Sanchez, Baylor University** George W. Bush: The Rise of Evangelical Rhetoric and a Modern-Day Christianity's Complacency
11:00 a.m. - 12:00 p.m.	**6**	**Isabella Brown, Baylor University** Baylor University: San Giuliano Archeology Research Site
11:00 a.m. - 12:00 p.m.	**6**	**Leaha Lindsley, University of Wisconsin - River Falls** Estrone Sulfate: Is it Related to Fetal Sex?
11:00 a.m. - 12:00 p.m.	**6**	**Josie Marquez, University of Colorado Boulder** Exploring Lipid Biomarker Profiles of Sulfate Reducing Bacteria in Low-Temperature Serpentinizing Systems Utilizing Batch Cultures
11:00 a.m. - 12:00 p.m.	**7**	**Carlos Chavira, St. Edward's University** Do P. granatum extracts have synergistic activity with antibiotics against S. aureus?
11:00 a.m. - 12:00 p.m.	**7**	**Andy Hims, St. Lawrence University** Alzheimer's and the Aging Brain
11:00 a.m. - 12:00 p.m.	**7**	**Carolina Menchaca, University of North Texas** Determining Programmed Translational Frameshifts in Bacteriophages
12:15 - 1:15 p.m.	**1**	**Isabel Garcia, St. Edward's University** Texas vs New Mexico: Efficacy of Drug Possession Mandatory Minimum Sentencing
12:15 - 1:15 p.m.	**1**	**Samantha Glidewell, University of North Texas** The Challenge of Reporting Growth Following Trauma
12:15 - 1:15 p.m.	**1**	**Carla Martinez-Perez, St. Lawrence University** Exposure to Immediate Rewards Increases Impulsive Choice in Humans
12:15 - 1:15 p.m.	**2**	**Jose Castaneda, Southern Nazarene University** Am I Right or Am I Protective?

12:15 - 1:15 p.m.	**2**	**Ryan Ellison, Kean University** Relationship Between Student Beliefs and Perceptions of Future Success Among Students at an Ethnically Diverse Institution: A Preliminary Analysis
12:15 - 1:15 p.m.	**2**	**Luisauny Gomez, Harding University** The Relationship Between Religiosity and Mental Health During the COVID-19 Quarantine
12:15 - 1:15 p.m.	**3**	**Cristobal Garcia-Quiroz, St. Edward's University** Quanitfying Health Attitudes and Access in U.S.-born and Immigrant LGBT+ Latinx People
12:15 - 1:15 p.m.	**3**	**Crystal Malagon, University of Wisconsin - River Falls** Race, Stigma and Asking for Help
12:15 - 1:15 p.m.	**3**	**Alexis Tibbits, The University of Kasnas** The Relationship Between Health Locus of Control and Growth in Interpersonal/ Relationships Following Trauma
12:15 - 1:15 p.m.	**4**	**Anahi Cantoran, Augsburg University** Active Learning vs. Traditional Lecturing: Assessing Student Learning Gains in Small Introductory Biology Classes at Augsburg University
12:15 - 1:15 p.m.	**4**	**Sophia Lopez, Baylor University** Review of Nonsense-mediated mRNA Decay Pathway, Metal Homeostasis and Detoxification
12:15 - 1:15 p.m.	**4**	**Ashley Santana, University of Central Florida** Characterization of BAF Subunit Expression Across Human Tissues Reveal Tissue- and Cancer-Specific Complexes
12:15 - 1:15 p.m.	**5**	**Vianney Campos, St. Edward's University** The Latinx Male: An Intersectional Study of Service Providers and Mental Health Services among Latinx men
12:15 - 1:15 p.m.	**5**	**Andrew Lindbloom, Baylor University** The Social Networks of Forager-Horticulturalists Entering the Market Economy
12:15 - 1:15 p.m.	**5**	**Frankeya Weatherspoon, University of Mississippi/Tougaloo College** Mental-Health Effects of COVID-19 on African American College Students
12:15 - 1:15 p.m.	**6**	**Gabriela Fierro, Baylor University** Increasing Energy Access in Developing Countries through Swarm Electrification and Localized Design
12:15 - 1:15 p.m.	**6**	**Darlene Gilroy, Eastern Washington University** Chemical Weathering of Deposits from the 1980 Mount St. Helens Eruption and its Effect on Stream Water Chemistry
12:15 - 1:15 p.m.	**6**	**Emily Kolbe, University of Wisconsin - River Falls** Determination of Rosa hybrida Floral Part Number Stability Based on Time of Season and Flower Position in Inflorescence

2:45 - 3:45 p.m.	**1**	**Victoria Jaimes, St. Edward's University** The Power of Authenticity in a Diverse Workplace
2:45 - 3:45 p.m.	**1**	**Karely Rodriguez Jimenez, University of Wisconsin Oshkosh** Encoding and Test Interaction in the DRM Paradigm
2:45 - 3:45 p.m.	**1**	**Autumn Underwood, University of North Texas** Borderline Personality Disorder: An Investigation into the College Experience
2:45 - 3:45 p.m.	**2**	**Marlie Harris, The University of Texas at Austin** Gender Differences in Cultural Mistrust and Mental Health in the Black Community
2:45 - 3:45 p.m.	**2**	**Tyania Pugh, University of North Carolina at Chapel Hill** Evaluating the Effectiveness of Faith-Oriented Psychotherapies: A Mixed Methods Review
2:45 - 3:45 p.m.	**2**	**Mariah Sibley, University of Kansas** Attitudes Toward Bisexual Women: A Comparison of Lesbian and Heterosexual Women
2:45 - 3:45 p.m.	**3**	**Tristan Henderson, Houston Baptist University** What did the first animal look like?
2:45 - 3:45 p.m.	**3**	**Melissa Leon Norena, Baylor University** Olfactory Detection of Antioxidants and Geosmin in Beetroot with Female Aedes aegypti and Their Effect on Oviposition
2:45 - 3:45 p.m.	**3**	**Mackenzie Weegman, University of Wisconsin - River Falls** Determining the Host Ranges in Bacteriophages and Analyzing Microbacterium Phage Shocker
2:45 - 3:45 p.m.	**4**	**Aaron Kinard, University of Wisconsin - Madison** Rural Education: Black students' descriptions and understandings of racialized Experiences in Rural, Predominantly White High Schools in Wisconsin
2:45 - 3:45 p.m.	**4**	**Rebecca Sanchez, St. Edward's University** STIs and Stigma: Effects of STI Diagnoses and Sexual Identity on Perceptions of Potential Partners
2:45 - 3:45 p.m.	**4**	**Zy'Miria Thompson, University of Mississippi/Alcorn State University** Re-Imagining Pleasure as Self Care: An Examination of Dirty Computer Through the Lens of the Erotic
2:45 - 3:45 p.m.	**5**	**Nathan Cumberbatch, Baylor University** An Investigation of Implicit Bias Through the Perception of Creative Artwork
2:45 - 3:45 p.m.	**5**	**Bianca Garcia-Gonzalez, St. Edward's University** Investigating the Effects of Prenatal Stress on the Regulation of Unc-33 in C. Elegans

2:45 - 3:45 p.m.	**5**	**Priscilla Louis, University of Central Florida (UCF)** A Historical Analysis of the Searchable NeuroNex Database of Bioluminescent Molecules Designed Toward the Expansion of an Open-Access Bioluminescent Toolbox
2:45 - 3:45 p.m.	**6**	**Cathy Preciado, The University of Texas at Austin** Undocumenting Superman
2:45 - 3:45 p.m.	**6**	**Gwendalynn Roebke, CU Boulder** Power, Death, and Freedom An Investigation into How Social Identity Affects Our Perception of Self and Our Existential Experience
2:45 - 3:45 p.m.	**6**	**Frank Wotton, St. Lawrence University** Models and Modality: A Modal-Semantic Approach to Theories and Surplus Structure
4:00 - 5:00 p.m.	**1**	**Brian Gyamfi, The University of Texas at Austin** Mood Disorder and Creativity across Culture
4:00 - 5:00 p.m.	**1**	**Sydney Schmidt, University of Wisconsin Oshkosh** Academic Outcomes of Students with ASD at UWO
4:00 - 5:00 p.m.	**1**	**Valerie Martin, St. Edward's University** Foster Parents' Experience: An Analysis of Secondary Trauma, Burnout, and Available Resources for Foster Parents
4:00 - 5:00 p.m.	**2**	**Emily Doffing, The University of Kansas** Trends in Adolescents' Responses to Passive and Active Suicidal Ideation
4:00 - 5:00 p.m.	**2**	**Tyra Franklin, University of Mississippi/Tougaloo College** Child Temperament and Work Productivity in Parents of Preschoolers During COVID-19
4:00 - 5:00 p.m.	**2**	**Scarlett Pugliese, Castleton University** Understanding Mental Health Motives in Individuals Charged with Driving Under the Influence
4:00 - 5:00 p.m.	**3**	**Tiffany Dang, East Tennessee State University** The Role of Social Media in the Attitudes of Euroscepticism in Italy in Comparison to Those in Germany and Hungary
4:00 - 5:00 p.m.	**3**	**Andrea Lamphere, University of Wisconsin - River Falls** Perceived Employment Desirability of Non-white, Non-heterosexual Women: The Influence of Social-Vocational Comfortability
4:00 - 5:00 p.m.	**3**	**Molly MacEachen, University of Colorado Boulder** Levers of Change at the Nexus of Business and Society in Relation to Sustainability
4:00 - 5:00 p.m.	**4**	**Erin Cleary, Baylor University** Evaluating the Impact of the COVID-19 Pandemic on Spiritual Grace

4:00 - 5:00 p.m.	**4**	**Dayani Davilla, University of North Texas** Creating Existing and Emerging Risk Maps Through Spatio-Temporal Patterns in Groundwater Concentration of Arsenic in Texas, 1990 to 2019
4:00 - 5:00 p.m.	**4**	**Albert Limones, St. Edward's University** Emptiness in the East and West: Nagarjuna and Jean-Pierre Duprey
4:00 - 5:00 p.m.	**5**	**Gregory Peterson, University of Wisconsin - River Falls** Obtaining the Eye for Cinematic Storytelling
4:00 - 5:00 p.m.	**5**	**Cameron Wilson, University of Mississippi/Rust College** Understanding the Spread of Misinformation on COVID-19 on Social Media
4:00 - 5:00 p.m.	**5**	**Michael Yirenkyi, St. Lawrence University** Industrial Design: The Best and Worst of Humanity
4:00 - 5:00 p.m.	**6**	**Isabel Carttar, University of Kansas - Lawrence Campus** Plea Bargaining and its Role in Feeding Mass Incarceration
4:00 - 5:00 p.m.	**6**	**Laurel Desmarais, Lee University** A Person's a Person, No Matter How Small: How to Best Insulate Children from Abuse
4:00 - 5:00 p.m.	**6**	**Michael Elwell, Texas A&M University-Commerce** LGBTQ+ Hate Crime in America
4:00 - 5:00 p.m.	**7**	**Grace Dennis, The University of Texas at Austin** The Role of Parental Discriminatory Experiences in Parents' Gendered Educational Expectations, Children's Educational Expectations, and Children's Academic Achievement in Black Families
4:00 - 5:00 p.m.	**7**	**Brianna Roberts, University of Wisconsin Oshkosh** The Extent Helmet Types Have on Helmet Motion
4:00 - 5:00 p.m.	**7**	**Kylie Sommer, Lee University** The Effect of COVID-19 on d/Deaf and Hard of Hearing College Students

FRIDAY, OCTOBER 2

	ROOM	PRESENTATION
10:30 - 11:30 a.m.	1	**Aulane Mpouli, Eastern Washington University** Molecular Docking Study of ITPA Protein Substrate Complex
10:30 - 11:30 a.m.	1	**Moinena Seisay, Bowie State University** A Facile Glycosylation Reaction Leading to Total Synthesis of Toyocamycin
10:30 - 11:30 a.m.	1	**Jimmy Martinez, St. Edward's University** The Synthesis of Structural Molecular Models of the Active Site of Aberrant Copper Zinc Superoxide Dismutase (SOD1): Evaluating How Structural Deformations Lead to Disease
10:30 - 11:30 a.m.	2	**Amanda Martinez, University of Wisconsin Oshkosh** The Effectiveness of Pre-college Programs
10:30 - 11:30 a.m.	2	**Nou-Chee Chang, Augsburg University** Analyzing Graphic Novels to Teach the Deconstruction of Gender in the Classroom: Anya's Ghost, The Witch Boy, and Nimona
10:30 - 11:30 a.m.	2	**Amber Richard, The University of Texas at Austin** Reviewing the Lived Experiences and Identity Intersectionality of Females on the Autism Spectrum
10:30 - 11:30 a.m.	3	**Alexis Cormier, Southern Nazarene University** A Comparison Study on the Effectiveness of Three Different College Algebra Interventions for Underprepared Students at a Small Private Christian University
10:30 - 11:30 a.m.	3	**Alexis Giles, The University of Texas at Austin** Positive Self-Perception and Memory
10:30 - 11:30 a.m.	3	**Ethan Reyes, Baylor University** Using Numerical Methods to Solve the 1-D Heat Equation in Python
10:30 - 11:30 a.m.	4	**Ainsley Ash, University of Mississippi** Barriers to First-Generation and Working-Class Student Success Through the Lens of Cultural Capital
10:30 - 11:30 a.m.	4	**Aaliyah Findley, University of Mississippi/Alcorn State University** Leaving No Black Child Behind: Effective Frameworks to Teach Black Children
10:30 - 11:30 a.m.	4	**Viviana Jaimes, St. Edward's University** The Effects of News Media on Social Trust and Well-Being in the Latinx Community
10:30 - 11:30 a.m.	5	**Marianne Garcia, St. Edward's University** The Social Competence, Self-Perceptions, and Quality of Life of Autistic Adults

10:30 - 11:30 a.m.	**5**	**Samantha Soto, Baylor University** Fiber Photometric Recordings of Rat Prelimbic Medial Prefrontal Cortex Activity in a Cocaine Conflict Model of Self Administration
10:30 - 11:30 a.m.	**6**	**Bryce Herlache, University of Wisconsin Oshkosh** The Effect of Timing, Program Design and Factors in Complex Training
10:30 - 11:30 a.m.	**6**	**Haille Perkins, St. Lawrence University** Reducing Data for the Arecibo Pisces-Perseus Supercluster Survey
10:30 - 11:30 a.m.	**6**	**Mikayla Wilson, Texas Christian University** Tracing the Evolution of Molecular Outflows in Massive Star Formation
11:45 a.m. - 12:45 p.m.	**1**	**Jennifer De La Fuente, Baylor University** Seeing the (Un)seen: The Northern Triangle Pleads to be Seen
11:45 a.m. - 12:45 p.m.	**1**	**Aracely Lara, The University of Texas at Austin** Visual forms of Transformation and Resistance: A Close Reading on East Austin's Murals
11:45 a.m. - 12:45 p.m.	**1**	**Melvin Vizcaino, St. Edward's University** Bilingual Speech Production: the Spanish of Central Texas as a Case Study
11:45 a.m. - 12:45 p.m.	**2**	**Tierra Foley, Baylor University** Classifying Diminutive Polyps by Convolutional Neural Networks
11:45 a.m. - 12:45 p.m.	**2**	**Brianna Martinson, East Tennessee State University** Stumbling into Virtual Worlds. How Resolution Affects Users' Immersion in Virtual Reality and Implications for Virtual Reality in Therapeutic Applications
11:45 a.m. - 12:45 p.m.	**2**	**Larry Stokes, University of Mississippi** Immunomodulatory Biomaterials for Cancer Immunotherapy
11:45 a.m. - 12:45 p.m.	**3**	**Radhia Abdirahman, University of Kansas** Understanding the Effects of Community Systems Changes in 4 Counties in Iowa
11:45 a.m. - 12:45 p.m.	**3**	**Alanis Burton, Lee University** The Correlation of Obesity and its Related Diseases in Comparison to Income in Counties in Tennessee
11:45 a.m. - 12:45 p.m.	**3**	**Mabelin Garcia De La Rosa, St. Lawrence University** An Examination of Disparities in Healthcare: Analyzing the Influence of Race on Outcomes of Emergency Room Visits
11:45 a.m. - 12:45 p.m.	**4**	**Mia Garcia, St. Edward's University** Refining Assay Recipes to Measure Immunological Responses

11:45 a.m. - 12:45 p.m.	**4**	**Gabriel Quintero Plancarte, Sonoma State University** Sequential Microbial Fuel Cell-Vermifilter System for Treatment of Winery Wastewater
11:45 a.m. - 12:45 p.m.	**4**	**Jenna Schober, University of Wisconsin - River Falls** Access to an Animal Activated Feeder: Effective in Reducing Anticipatory Behaviors in Laboratory Rats?
11:45 a.m. - 12:45 p.m.	**5**	**Shaunessey Burks, University of Mississippi/Alcorn State University** Clinical Repurposing of Antiplatelet Agents from Cardiovascular Medicine to Treat Metastatic Cancer
11:45 a.m. - 12:45 p.m.	**5**	**Curtis Linton, University of New Hampshire** Modeling the Lateral Mixing of Aerosols
11:45 a.m. - 12:45 p.m.	**5**	**Nicholas Smoker, Trinity University** Weights and Gates: Automated Testing of Non-Functional Requirements
11:45 a.m. - 12:45 p.m.	**6**	**Kendra Letch, University of Wisconsin - River Falls** Evaluation of Dairy, Turkey Manure, and Digestate on Soil Fertility and N Leaching in Field Corn
11:45 a.m. - 12:45 p.m.	**6**	**Karina Moreno, St. Edward's University** Assessing the Localization of DAF-16 in C. Elegans Unc-33 Mutants
11:45 a.m. - 12:45 p.m.	**6**	**Maquela Noel, Baylor University** Examining The Impact of a Father's Childhood Experiences on the Relationship He Has With the Mother of His Baby

POSTER PRESENTATION SCHEDULE

THURSDAY, OCTOBER 1

	ROOM	PRESENTATION
11:00 a.m. - 12:00 p.m.	**8**	**Wendolyn Martinez, Eastern Washington University** Propaganda: USSR And US Comparing Propaganda rom the US And USSR Produced for The Advancement of Public Approval for Hydro-Projects in the 1930s
11:00 a.m. - 12:00 p.m.	**8**	**Jorge Maximiliano Armendariz, University of Colorado Boulder** Educational Disparities In Latinx Newcomer Student Populations
11:00 a.m. - 12:00 p.m.	**8**	**Kaylee Hogness, Baylor University** The Variety of Variables That Affect Etruscan Burial Practices
11:00 a.m. - 12:00 p.m.	**8**	**Hope Sands, Eastern Washington University** Understanding the Historical Past of Fort Spokane through Landscape Archaeology
11:00 a.m. - 12:00 p.m.	**8**	**Madison Tinsley, Sonoma State University** Reclaiming Indigenous Space Through Protest Art: The 1969-1971 Native American Occupation of Alcatraz Island
11:00 a.m. - 12:00 p.m.	**9**	**Symone Gelay, Kean University** Auditory Hallucinations Within The D/Deaf Schizophrenia Population: Bias Analysis Within A Criminal Case
11:00 a.m. - 12:00 p.m.	**9**	**Tylea Hernandez, University of North Georgia** Acculturative Stress, Mental Health and Academic Engagement of Young Adult Hispanic Immigrants
11:00 a.m. - 12:00 p.m.	**9**	**Kaitlyn Knight, Southern Nazarene University** The Impact of a Compassionate Love Writing Intervention on State Attachment to God
11:00 a.m. - 12:00 p.m.	**9**	**Michelle Serrano, University of North Texas** The Effects of the Aftermath of Immigration Enforcement on Supporters of Victims of an Immigration Raid: A Case Study of Paris, TX
11:00 a.m. - 12:00 p.m.	**9**	**Rayna Webb, Trinity University** Can children learn verbs even when irrelevant events are present?
12:15 - 1:15 p.m.	**8**	**Mahlet Adugna, Baylor University** Regulation by Nonsense-mediated mRNA Decay and Environmental Influences on the Pathway

12:15 - 1:15 p.m.	**8**	**Ashley Destin, Eastern Washington University** Size Scaling in the Skull of North American Fields as Adaptations for Prey Acquisition
12:15 - 1:15 p.m.	**8**	**Samantha Romines, East Tennessee State University** Impact of Heavy Metals on Growth and Mortality in a Freshwater Bivalve (Epioblasma brevidens)
12:15 - 1:15 p.m.	**8**	**Cesar Sanchez, Emporia State University** Sugar, Spice, and Everything (Not) Nice: The Effects of Red Pepper on Resting Energy Expenditure and Macromolecule Oxidation
12:15 - 1:15 p.m.	**8**	**Alyssa Wheeler, Southern Nazarene University** Asian Tiger Insecticide Resistance and Arboviral Surveillance in Oklahoma
12:15 - 1:15 p.m.	**9**	**Triniti Armstrong, Baylor University** A New Camera for Artemis
12:15 - 1:15 p.m.	**9**	**Nancy Dankwah, The University of North Texas** Design of a Platform to Study Cell to Cell Communication in Osteoarthritis
12:15 - 1:15 p.m.	**9**	**Thomas Morris, Eastern Kentucky Universtiy** Does voice really matter? The Impact of Voice on Effort and Recall
12:15 - 1:15 p.m.	**9**	**Jiselle Ye, University of Colorado Boulder** Towards the Scaling Up of Perovskite Solar Cells: Perovskite Photovoltaic Module Modeling and Optimization
12:15 - 1:15 p.m.	**10**	**Efram Aredo, University of Colorado Boulder** 5-G
12:15 - 1:15 p.m.	**10**	**Blake Holman, The University of Texas at Austin** Popularity in Three-Dimensional Stable Marriage W\ith Ties
12:15 - 1:15 p.m.	**10**	**Jeremy Webb, University of Colorado Boulder** 3D Glass-based RF filters for 5G Communication Systems
2:45 - 3:45 p.m.	**8**	**Camille Chossis, Wesleyan University, CT** Abnormal Cytokine Activity as a Potential Contributor to C9orf72 Dependent Neurodegeneration
2:45 - 3:45 p.m.	**8**	**Raul Iglesias, Southern Nazarene University** Identification of Mosquitoes in Oklahoma
2:45 - 3:45 p.m.	**8**	**Jose Navarro Arriola, University of Colorado Boulder** Machine Learning to Predict Anti-Malarial Compounds

2:45 - 3:45 p.m.	**8**	**Rachael Pentico, Eastern Washington University** Differences in Plant Soil Feedbacks with Respect to Slope Aspect
2:45 - 3:45 p.m.	**8**	**Batool Unar Syed, Baylor University** Oviposition and Olfactometer-Based Behavioral Responses in Ae. aegypti Mosquitoes
2:45 - 3:45 p.m.	**9**	**Porscha Bland, Emporia State University** The Impact Of Adverse Childhood Experiences (ACE) On Adult Health and Mental Health
2:45 - 3:45 p.m.	**9**	**Tassie Garrett, University of North Georgia** Multiple Stressors Affecting Anxiety and Depression in College Students
2:45 - 3:45 p.m.	**9**	**Aryana Hernandez, Sonoma State University** Judgments and the Perceived Controllability of Social Identities
2:45 - 3:45 p.m.	**9**	**Xaria Hicks, The University of North Texas** The Disproportionality of Young Children From Linguistic and Culturally Diverse Back Grounds with Autism Spectrum Disorder
2:45 - 3:45 p.m.	**9**	**Samantha Sanchez, Eastern Washington University** Traumatic Experiences and Mental Health Among College students
4:00 - 5:00 p.m.	**8**	**Carla-Cristina Edwards, Baylor University** Olfactory Affects on Oviposition in Aedes aegypti: An Exploratory Study
4:00 - 5:00 p.m.	**8**	**Christian Escritt, Southern Nazarene University** Learning From Home: Conductometric Titrations
4:00 - 5:00 p.m.	**8**	**Marwa Osman, University of Colorado Boulder** Red Light at Night: Identifying Unexpected Sources of Circadian Disruption
4:00 - 5:00 p.m.	**8**	**Nahom Zewde, Earlham College** Designing Affordable and Efficient Dye-Sensitized Solar Cells Using Natural Pigment Extracted from Plants
4:00 - 5:00 p.m.	**9**	**Cassie Gibson, University of North Texas** Ceramic Preferences Among the Ancient Southwest
4:00 - 5:00 p.m.	**9**	**Christian Guerrero, West Texas A&M University** Analysis of the Antimicrobial Efficacy of Nano-Engineered Silver Coatings
4:00 - 5:00 p.m.	**9**	**Rebecca Holmes, University of Colorado Boulder** Field Speciation of Hexavalent Chromium: An Alternative Method

4:00 - 5:00 p.m.	**9**	**Austen Keever, University of Colorado Boulder** Post-Pandemic Urban Living
4:00 - 5:00 p.m.	**9**	**Theresa Lee, Eastern Washington University** Prisoner Reentry: College Perceptions of Reentry Barriers in a Northwest Community

FRIDAY, OCTOBER 2

	ROOM	PRESENTATION
10:30 - 11:30 a.m.	**8**	**Lauren Baldwin, Southern Nazarene University** Is My Body a Cage?: Radical Dualism and Religious Orientation
10:30 - 11:30 a.m.	**8**	**Vincent Bozinov, Baylor University** Gender Differences of Prospective Memory in Relationships and the Workplace
10:30 - 11:30 a.m.	**8**	**Louis Nunez, University of Colorado Boulder** Opioids and How Stressor Controllability Influences Drug Seeking Behavior in Mice
10:30 - 11:30 a.m.	**8**	**Rosalia Triana, Lamar University** Analysis of Lamar University NCAA Student Athletes and Non-Student Athlete Differences in Health, Health Behavior and Healthcare Utilization During Global Pandemic
10:30 - 11:30 a.m.	**8**	**Joel Zamora, University of North Texas** Congregational Support Moderating Schizotypy's Relationship Between Spiritual Experiences, Paranormal Beliefs, and Conspiracy Beliefs
10:30 - 11:30 a.m.	**9**	**Gabriela Davila, Sonoma State University** Sexual Health and Sex Education Access Among Latina College Students
10:30 - 11:30 a.m.	**9**	**Jarvis De Leon, Southern Nazarene University** Social Identity, Legality, and Immigration: The Effects of House Bill 1804 on Hispanic or Latino Communities in Oklahoma
10:30 - 11:30 a.m.	**9**	**Ben Falcon, Trinity University** Pawns at Play: Refugees and the Game of Foreign Policy
10:30 - 11:30 a.m.	**9**	**Morgan Koziol, Baylor University** Investigating Quality of Life Differences: First-Generation vs. Generational College Student Experiences at Baylor University
10:30 - 11:30 a.m.	**9**	**Megan Nations, East Tennessee State University** Preventative Healthcare Measures for Diabetes

11:45 a.m. - 12:45 p.m.	**8**	**Andrea Chamorro, University of Colorado Boulder** Simulating Goal-Oriented Social Interaction in Confined Spaces via the Social Force Model
11:45 a.m. - 12:45 p.m.	**8**	**Malachi Chukwu, Eastern Washington University** Assessing Developmental Approaches Since the Mid-20th Century and its Outcomes for the Underdeveloped Countries
11:45 a.m. - 12:45 p.m.	**8**	**Kiet Luan, The University of Texas at Austin** The Search for a More Cost-Effective Nitrate Reduction
11:45 a.m. - 12:45 p.m.	**8**	**Diego Rios, University of Colorado Boulder** Using Smartphone Sensors for Virtual Labs During COVID-19 Era
11:45 a.m. - 12:45 p.m.	**8**	**Alexis Simmons, Baylor University** Tumor Displacement Prediction From Intraoperative Magnetic Resonance Imaging Using Viscoelastic Finite Element Biomechanical Modeling
11:45 a.m. - 12:45 p.m.	**9**	**Nick Ahmed, Baylor University** Relations Between Severity of Substance Use and Willingness to use Digital-Based Treatments
11:45 a.m. - 12:45 p.m.	**9**	**Francisco Berrones, Southern Nazarene University** Hope Across Borders: A Look at How Culture Influences Hope
11:45 a.m. - 12:45 p.m.	**9**	**Bryan Medina, University of Central Florida** Investigating Artificial Neural Networks Optimized for Ecological Auditory Tasks as a Normative Model of Pitch Perception
11:45 a.m. - 12:45 p.m.	**9**	**Mariah Olinger, University of Wisconsin - River Falls** Opioid Use Disorder (Oud) Risk-Genes Across Cortical Developmental Periods
11:45 a.m. - 12:45 p.m.	**9**	**Adam Rutledge, University of North Texas** Mediums of Influence: Imagery and Visualizations of Immigration in Popular Media in the US

ORAL ABSTRACT PRESENTATIONS

Radhia Abdirahman, abdirahmanradhia@gmail.com
University of Kansas, with Ruaa Hassaballa and Dr. Vincent T. Francisco
Public Health

Understanding the Effects of Community Systems Changes in 4 Counties in Iowa

Alcohol, also known as ethyl alcohol or ethanol, is the world's most commonly used depressant with the highest risk of causing harm to oneself and others (Hosking, 2020). Underage and binge drinking is a prevalent phenomenon that effects youth not only in the United States, but countless other countries. In Iowa, 12 of the most at-risk counties had binge and underage drinking preventative interventions put in place by the Iowa Department of Public Health's Bureau of Substance Abuse. The purpose of this study is to conduct a secondary analysis of the Iowa Partnerships for Success Grant to determine which counties, out of the twelve studied, were the top performing and low performing in reducing binge drinking and underage drinking levels. The study defines the top performing and low performing counties based on the number of Community Systems Changes. The results of this study show that the number, alone, of Community Changes do not translate to improved community indicators. These results suggest that for interventions to be effective there needs to be more community changes with a larger geographic reach and a higher dosage in terms of behavior change strategies.

Savannah Anderson-Knight, sda885@utexas.edu
The University of Texas at Austin
Government, Anthropology, Education

I'm Not One of Your Little Friends

This paper will examine how Black college students at predominantly white institutions (PWIs) experience course curriculums about race and racism, as well as the role teacher identity plays in these experiences. Using semi-structured zoom interviews, students will discuss their assorted experiences in college courses related to race and racism. Guided questions will help explore the role teacher identity played in their experiences. Data from the interviews will be sorted into various thematic groups and analyzed further through the lenses of critical race theory and culturally relative pedagogy. I expect to find correlations between teacher race and the types of student experiences, as well as generational gaps in communication. The goal is to better understand how to teach race effectively, without negatively impacting marginalized students. Further research might explore ways to mitigate the findings of this study.

Ainsley Ash, apash@go.olemiss.edu
University of Mississippi, with Dr. James Thomas
Sociology

Barriers to First-Generation and Working-Class Student Success Through the Lens of Cultural Capital

This study seeks to explore how University of Mississippi first-generation and working-class students attain cultural capital, the barriers that exist to acquisition, how it is employed once attained, and what formal and informal institutions help students learn the unspoken rules of higher education. It entails a two-part research design. First, this study uses a survey instrument to compare barriers and pathways to success among FG/WC students and non-FG/WC students at the University of Mississippi. The second part of this study uses in-depth interviews with a sample of FG/WC students from the initial survey to examine in finer detail how they make sense of their experiences at the University of Mississippi. As there has been little to no formal research conducted on the student success of this demographic, there is an imperative to attain a greater understanding of their undergraduate experiences. In doing so, findings can serve to create informed initiatives that are devoted to the social, academic, and financial wellbeing of this demographic.

Tatiana Bakken, bakkent3570@my.uwstout.edu
University of Wisconsin - Stout, with Dr. Heather Terhorst-Miller
Psychology

Cultural Competence Among Psychology Trainees: An Examination of the Cultural Knowledge and Awareness in Psychology Students at the Start of Their Internship Year

Sue's Multidimensional Model of Cultural Competence (2001) is a frequently cited model of cultural competence in the counseling and psychology professions. Prior research has examined racial/ethnic and program differences in cultural competence (relevant citation[s]). The current study was designed to explore the knowledge and awareness of cultural competence in predoctoral psychology trainees at the beginning of their internship year. It was hypothesized that non-white students would score higher on cultural awareness than their white counterparts (Hypothesis 1) and that counseling psychology students would score higher on cultural knowledge than clinical psychology students (Hypothesis 2). Predoctoral interns beginning an APPIC internship during the study timeframe were invited to complete an anonymous survey. Participants were asked to complete a demographic survey and the Multicultural Counseling Knowledge and Awareness Scale (MCKAS; Ponterotto et al., 2002), which were presented in randomized order. The current study is the first part to a larger, more in-depth study where the progress of cultural competence will be examined across the internship year. Results from the initial round of collected data did not support the first hypothesis that doctoral students of color report more higher levels of cultural awareness. For Hypothesis 2, counseling psychology students reported having more knowledge on the MCKAS than did clinical psychology students, supporting the second hypothesis. Future research is required on this topic in order to ensure that anyone can receive effective counseling services no matter their race or ethnicity.

Isabella Brown, isabellabrown2011@gmail.com
Baylor University, with Dr. Davide Zori
Anthropology

Baylor University: San Giuliano Archeology Research Site

Death affects everything from social, political, and economic aspects of life. The individuals left behind by the dead show their faith in the archeological record. Although, not everyone has access to the rights of the religion they believe in, specifically women, in a liminal status. Studies conducted in Poland highlight the atypical burial practices used in the Early Medieval Period (500-1000 AD). The archeological record recognized that the change in the religion did not affect the burial practices immediately. The deviation in the study conducted in Poland and Ireland have similarities in the nonconforming nature of the site in Barbarano Romano, Italy. The archeological sites conducted in Italy demonstrate a connection to women and children's burials with each other. The study of the San Giuliano site is at the preliminary stage of research currently, but through bioarcheology, we hope to find out more in a future study. The study of bioarcheology can give insight into the past. Infant Bones saw in the archeological record, but they are also useful in understanding the past. There are limitations of bioarcheology, and the methods used to assess the past. The history of archeology in Italy is a state-controlled national heritage. The benefits of the San Galliano Archeological Research Project (SGARP) and how the project affected the people of Barbarano Romano.

Shaunessey Burks, shaunessey@students.alcorn.edu
University of Mississippi/Alcorn State University, with Dr. Thomas Werfel
Biomedical Engineering

Clinical Repurposing of Antiplatelet Agents from Cardiovascular Medicine to Treat Metastatic Cancer

Cancer metastasis kills most patients; ninety percent of cancer deaths happen in the metastasis phase. Platelets play a key role in cancer metastasis, and platelet activation is an important step in the progression of malignancies. In the cardiovascular setting, platelet activation occurs in response to vessel injury and is important for the arrest of bleeding. Platelet activation during advanced cardiovascular diseases (CVDs) leads to vascular occlusion and ischemic damage. In malignant tumors, cells can act equivalent to injured cells by communicating with platelets to activate them by the same mechanisms by which they are activated in response to vascular injury. The sufficient roles of platelets in the metastatic cascade have prompted the usage of antiplatelet agents from cardiovascular medicine to be utilized to treat metastatic cancer in addition to their usefulness in CVD. Multiple pathways contribute to platelet activation and could potentiate cancer metastasis. Here, for the purpose of this research, four pathways important for the activation of platelets: Cyclooxygenase, Thromboxane, P2Y12, and Thrombin were reviewed. In theory, by blocking any of these pathways metastasis can be prevented and the mortality associated with metastatic cancer decreased. The future of this approach is very promising because of the availability of safe drugs to repurpose from CVD. Soon, the repurposing of these safe and effective

antiplatelet drugs could provide transformative new treatment options for those suffering from cancer metastasis.

Alanis Burton, aburto02@leeu.edu
Lee University, with Dr. Benjamin Christmann
Public Health

The Correlation of Obesity and its Related Diseases in Comparison to Income in Counties in Tennessee

Obesity (measured in BMI) and its comorbidities are prevalent issues that affect individuals as well as surrounding communities. While there are predicated causes and predispositions for obesity, those with lower incomes tend to have higher obesity rates (Ahmad et al., 2018). Using an epidemiological approach, this study evaluated the income, obesity rates, and the rates of obesity related illness of each county within the state of Tennessee to determine if obesity is a social determent influenced by income. The data selected indicates significant correlations between income and many of obesity's comorbidities. The data also showed a difference in obesity and its comorbidities rates when comparing rural to urban areas. The obesity epidemic is an issue that is caused by many factors and requires continued study to combat the issue of obesity.

Vianney Campos, vcampos1@stedwards.edu
St. Edward's University, with Dr. Laurie Cook Heffron
Sociology

The Latinx Male: An Intersectional Study of Service Providers and Mental Health Services Among Latinx Men

The lack of conversation on the mental health of Latino men has larger scale societal impacts such as the sustainment of mental health stigmatization among Latino men. It is crucial for social service providers to use an intersectional lens when assessing the factors that are influential to mental health service access among Latino men. These factors may include but are not limited to: race, culture, sexuality, and gender identity. Low rates of mental health service use among Latino men is influenced by barriers such as socioeconomic status, cultural/traditional ideologies, knowledge of mental health services, availability of mental health services, and discrimination within mental health services. The intent of the current study is to explore the cultural responsiveness among social service providers to identify and address different factors of Latinx identities and assess in what ways these factors affect Latino men's views on mental health and access to services. Participants will be asked questions about their experiences providing services to Latino male clients, their perspectives on access to mental health, and recommendations about how service providers can provide their clients with optimal assistance.

Anahi Cantoran, cantoraa@augsburg.edu
Augsburg University, with Dr. Jennifer Bankers-Fulbright
Biology

Active Learning vs. Traditional Lecturing: Assessing Student Learning Gains in Small Introductory Biology Classes at Augsburg University

The use of active learning practices increases student performance and reduces failure rates in undergraduate STEM courses in the U.S. [Freeman2014]. However, the dominant teaching practice remains instructor-centered traditional lecturing, and student-centered approaches that incorporate active learning are not commonly used in introductory biology classes with less than 50 students. We studied the extent to which student-centered teaching is being practiced in the introductory biology sequence at Augsburg University and if that correlates with learning gains that are made by students. To determine the teaching practices used by instructors, the Classroom Observation Protocol for Undergraduate STEM (COPUS) was used in different introductory biology classrooms, and the IMCA (Introductory Molecular and Cell Biology Assessment) and EcoEvo-MAPS (Ecology and Evolution Measuring Achievement and Progression in Science) assessments were used as tools to measure the learning gains made by students [Smith 2013; Shi 2010; Summers 2018]. We found that the dominant teaching practice as a whole in Augsburg University's introductory biology sequence is instructor-centered traditional teaching. However, one of the two courses incorporate more student-centered teaching behaviors than the national average [Stains 2018; Freeman 2014]. Analysis of IMCA and EcoEvo-MAPS demonstrated positive learning gains in most classrooms, but this was not significantly correlated with the percent of student-centered teaching. If these trends continue, our study may further support the evidence that more student-centered teaching alone doesn't always result in greater student learning gains [Andrews 2011].

Isabel Carttar, isabelcarttar@ku.edu
University of Kansas - Lawrence Campus, with Dr. Christopher Perreira
Sociology; Law & Society

Plea Bargaining and its Role in Feeding Mass Incarceration

Through the use of a literature synthesis, I outline why the role of plea bargaining should be considered a serious factor for studies of incarceration. I also examine plea bargaining's origins as rooted in a logic of social control and argue that plea bargaining functions to perpetuate racial inequality in society and in the courts without much notice from researchers and the general public concerned with the prison system. In order to show this, I first explore the history of plea bargaining and how it became such an important part of the U.S. legal culture. Then, I analyze several implications of inequality to show how they all aid in feeding mass incarceration. I close with an open-ended discussion of why plea bargaining should be reconsidered in conjunction with mass incarceration, as well as the potential effects that reforming plea bargaining could have on reforming the criminal justice system as a whole.

Jose Castaneda, acastaneda@mail.snu.edu
Southern Nazarene University, with Dr. Ronald Wright
Psychology

Am I Right or Am I Protective?

Although there are multiple definitions of intellectual humility (IH), it can be agreed that IH is primarily focused on understanding the limits that one has on their own knowledge and beliefs (Hill et al., 2018). Due to the numerous ways that religious traditions are different in their views, the use of a single scale of IH will cause limitations due to the limitations of using a single religion's perspective. For the Christian tradition, the theistic IH scale focuses on the perspective of God, through subscales of submission to God, the recognition of human finite limitations, and the belief bias limitations. The present study furthers the knowledge and understanding of theistic IH by examining the relationship that it has with the religious orientations. Specifically, it was hypothesized that there would be a tradeoff seen between religious orientation and theistic intellectual humility such that security-orientated religious orientation would be positively related to submission to God and finite limitations and growth-focused orientation would be positively related to belief bias limitations. Participants were 222 adults, primarily students, from two private Christian universities located in the Midwest. Participants completed an online survey which included the Theistic Intellectual Humility Scale, Defensive Theology Scale, and the Batson Quest Scale. As hypothesized, intellectual submission to God and an understanding of human finite limitations were positively correlated with security-orientated religious orientation. In contrast, a recognition of belief bias limitation was positively correlated with growth-focused religious orientation. This study helps contribute to an unknown perspective of IH and religion.

Nou-Chee Chang, changn@augsburg.edu
Augsburg University, with Dr. Adriane Brown, Stewart Van Cleve and Dr. Joaquin Munoz
Secondary Education, English Communication Arts

Analyzing Graphic Novels to Teach the Deconstruction of Gender in the Classroom: Anya's Ghost, The Witch Boy, and Nimona

Graphic novels have become popular tools in the secondary classroom to teach literature along with combating social inequities such as race, class, and gender in the classroom. The study explores how graphic novels can be used to teach the deconstruction of gender in classrooms. It aims to find how specific books can dispel the dichotomized understanding of gender in order to be used for lessons. A content-analysis is conducted on three graphic novels: _Anya's Ghost_ by Vera Brosgol, _The Witch Boy_ by Molly Ostertag_ and _Nimona_ by Noelle Stevenson. The analysis investigates each novel on how the visuals, prose, and narrative fit the subset of themes and theories related to gender. The items would be recorded for later analysis around which themes are most prevalent in each independent novel. The data shows that each of the books depicts gender socialization, gender expectations, gender stereotypes, and/or gender representation. Anya's Ghost_ emphasizes gender socialization through its coming-of-age narrative, _The Witch Boy_ uses fantasy elements as allegories to showcase gender stereotypes and expectations, and

Nimona's _use of visuals readapt the fantasy genre and the gender representation. The study aims toward educators working in secondary education literature classrooms that want to use graphic novels to teach. The implication is that these three graphic novels can be used by educators as a foundational piece to build lessons around dispelling gender polarization and understanding the complexity of gender.

Carlos Chavira, cchavir1@stedwards.edu
St. Edward's University, with Dr. Trish Baynham
Biology

Do P. granatum extracts have synergistic activity with antibiotics against S. aureus?

The phenomenon of antimicrobial resistance (AMR) has increased and threatens public health as it results in infections that can no longer be controlled with current therapeutic approaches. This calls for global urgency to address this issue with novel methods in combating this problem. Recent studies have shown that certain plant extracts have antimicrobial compounds and have the potential in fighting AMR bacteria. A fruit that has shown antimicrobial activity in previous studies is the pomegranate or P. granatum. Ms. Zoe Lichtenberg found that pomegranate extracts showed antimicrobial activity. This study will confirm that P. granatum has antimicrobial activity and also determine whether it has any synergistic activity with an antibiotic. For this study, extracts previously prepared by Ms. Lichtenberg will be used to test for antimicrobial activity using a Kirby Bauer disk diffusion and a minimum inhibitory concentration (MIC) against the standard strain of S. aureus (ATCC 29213). Gentamicin will also be tested for the MIC. Once the MIC of both extract and antibiotic are acquired, an assay will be performed to test for synergistic activity using various concentrations of each in combination. The fractional inhibitory concentration (FIC) index will then be used to determine if there is any synergistic interaction between the plant extract and the antibiotic against the bacterium. If successful, this could lead to effective therapeutics for use in AMR bacteria. Future research in this topic can include toxicity of pomegranate extracts and how it can be applied to therapeutic medicine.

Jada Childs, jchilds2@emich.edu
Eastern Michigan University, with Dr. Heather Janisse
Psychology

Effect of Stress on Health of African American Women in Low Income Neighborhoods

This project aims to review the current literature on the relationship between neighborhood environment, socioeconomic disparity, stress, and the effects of stressors on health, among African American women. The purpose of this research is to increase understanding of the unique stressors that African American women face, and the consequences this stress may have on health. Health problems, like obesity, are more prevalent in populations of African American women than any other population in the United States. Furthermore, stress has been found to disproportionately affect the health of African American women when compared to European American women.

Factors such as neighborhood environment, socioeconomic status, and familial relationships play a significant role in the stress experienced by these women. This research hopes to explain how psychological stress and living in a low-income neighborhood work together as instrumental factors impacting obesity and mortality rates in this community. Information from this project may be used in future research or to establish programs, centers, and clinics to aid in mitigating neighborhood and psychological stress to decrease rates of obesity, disease, and mortality within these communities. Special thanks to the Eastern Michigan University McNair Scholars Program for supporting this research, the Eastern Michigan University Psychology Department for providing research services, and Dr. Heather Janisse for her guidance and mentorship.

Erin Cleary, erin_cleary1@baylor.edu
Baylor University, with Dr. Jason Paltzer
Religion, Spirituality, and Public Health

Evaluating the Impact of the COVID-19 Pandemic on Spiritual Grace

Determining how COVID-19 is impacting people's spiritual health by evaluating changes in spiritual grace and overall well-being provides both public health and religious professionals alike opportunities to meet the needs of the populations they serve. Prior research has shown that in times of crisis it is common for communities to gather together in a supportive manner, but social isolation caused by COVID-19 is preventing Americans from engaging in this coping strategy. In addition, the economic repercussions of the pandemic have left many Americans unemployed and struggling to meet their physical or financial needs. A survey asked United States citizens questions regarding COVID-19, pecuniary needs, social isolation, and changes in relationships with themselves, others, and God or other spiritual force. Results concluded that while COVID-19 has not significantly impacted people's relationship with God or spiritual grace, social isolation from the pandemic has caused an increase in distressful emotions. Spiritual leaders are encouraged to communicate the importance of faith-based activity on an individual level. Further research may include how to build resiliency and coping strategies that Americans can use during difficult times and the role spiritual health plays in preventing humanitarian disasters from inflicting potential health disparities.

Alexis Cormier, acormier@mail.snu.edu
Southern Nazarene University
Mathematics Education

A Comparison Study on the Effectiveness of Three Different College Algebra Interventions for Underprepared Students at a Small Private Christian University

Literature suggests that the bulk of students that make up remedial college algebra classes are minority, low income, and first-generation college students. They leave underfunded high schools that lack the resources to help them succeed which leaves them underprepared for college level math. This places them in zero credit remedial or developmental math classes that aim to catch

them up to their peers. These zero level classes do not count towards graduation which can lengthen the time and money spent getting their degree or discourage students from continuing their education altogether. Universities have taken a notice to this and have decided to offer a few different solutions like summer bridge programs, integrating supplemental instruction, peer mentoring, and tutoring. There have not been many studies that compare different types of remedial college algebra, and there have not been many studies that look at the effectiveness of the remedial class at a small private university. The proposed study fills that need as this study looks at three different versions of remedial college algebra that have taken place over 6 years at a small private Christian university.

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Neuroscience

An Investigation of Implicit Bias Through the Perception of Creative Artwork

Researching implicit bias and understanding the underlying mechanics of social interactions plays a key role in progressing the global community towards achieving a world with equality and fairness. The current study aims to investigate the prevalence of implicit bias by observing how individuals perceive artwork; specifically, though, we aim to observe how the assumed race of the artist affects a person's evaluation of the artwork. Furthermore, our goal is to understand how much sleep affects the bias of the participants. Related studies suggest that the individuals of our study would exhibit a significant negative bias towards artists that they assumed to be African American (Alkozei et al., 2017, 2018). Additionally, current data suggest that sleep duration directly influences the expression of implicit bias (Alkozei et al., 2017, 2018; Ben Simon et al., 2020; Zhang et al., 2019). In our study, 201 participants evaluated a series of 12 abstract paintings paired with either a stereotypical Caucasian name or a stereotypical African American name. Our study observed that individuals do not evaluate artwork paired with a stereotypical African American name significantly different from artwork paired with a stereotypical Caucasian name, $t(200)=-0.408$, $p=0.684$. Moreover, our data did not show a significant correlation between sleep duration and implicit bias, $r(200) = -0.025$, $p=0.721$.

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Political Science

The Role of Social Media in the Attitudes of Euroscepticism in Italy in Comparison to Those in Germany and Hungary

With the rise of right- and left-wing populism growing in Europe, it is important for political scientist to look into this trend and what is causing it. In the age of technology and social media, it is important to look at its correlation with the growth of Eurosceptic attitudes which attribute to populist voting. This growth can be seen in many countries in the European Union, a political and

economic union that binds many nations in Europe together. Past researchers look into populism in a specific country or a certain region in Europe and there has yet to be an in-depth look at Euroscepticism across many different countries in the EU. Euroscepticism is the notion that one is sceptic of the European Union and its institutions. Many populist party leaders have turned to social media to reach out and to gain followers. Social media has been a great platform for misperception and false news. Social media is relatively easy to use and is used by many to obtain political information. For this research, there is a push to look into social media sites from populist political actors in Germany, Italy, and Hungary. By doing content analysis and looking into the reactions of followers, there will be a better understanding of how social media can help spread the growth of Eurosceptic attitudes in citizens in the EU. This information helps the EU obtain an understanding that can help leaders in the EU fight against populism and false social media perception that is undermining its very own institutions.

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Geography and Public Health

Creating Existing and Emerging Risk Maps through Spatio-Temporal Patterns in Groundwater Concentration of Arsenic in Texas, 1990 to 2019

Exposure to Arsenic (As) is known to be associated with several adverse health outcomes including skin and internal cancers. Geological processes and anthropogenic activities are known to influence As concentrations in groundwater and can lead to geographical differences in risk of exposure. In Texas, groundwater is the major source of water consumption and contains high As concentrations. While previous research has identified spatial and temporal trends in As concentrations in Texas, their focus is limited to relatively small geographic regions and/or short time periods. This paper uses a geostatistical model and well data from the Texas Water Development Board's groundwater quality database to identify areas with historically elevated values of As in groundwater as well as those areas showing persistent increase. The first map identifies those areas that are consistently in the top one third of As concentration between 1990 to 2019. The second map identifies those areas that show persistent increases in As concentrations over 5-year increments for the same time period. The results show several areas of concern especially in the panhandle and gulf coast regions, where As concentrations exceed the 10 ug/L levels that studies show may contribute to elevated risk of several diseases. Developing maps of existing and emerging risk of exposure will help guide health care intervention efforts for diseases that are commonly associated with As.

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Latin American Studies, Environmental Studies

Seeing the (Un)seen: The Northern Triangle Pleads to be Seen

This research seeks to answer why mass waves of asylum seekers from the Northern Triangle countries (Guatemala, Honduras, El Salvador) have been arriving in groups of thousands at the Mexico-United States border. This research seeks to spark discussion on the thousands of asylum seekers who are choosing to leave their home countries. Currently, there are crimes against humanity in the Northern Triangle countries. These crimes have been brutally affecting women, indigenous people, children, and the LGBT+ community. The three Northern Triangle countries share some commonalities in push factors, some of which are gang violence, sexual violence towards women and children, climate change, impunity, corruption, and food insecurity. However, the troubles do not end when migrants leave their home countries. The migration passage (passage from their home countries to the United States) poses a myriad of adversities like sexual assault, gang violence, theft of important documentation and other personal belongings, and death due to external conditions. La Bestia is the most well-known migration route that begins at the border between Guatemala and Mexico. The question that drives this research is, "What push factors are causing mass migration from Northern Triangle countries to the United States?"

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Psychology

The Role of Parental Discriminatory Experiences in Parents' Gendered Educational Expectations, Children's Educational Expectations, and Children's Academic Achievement in Black Families

Research shows that parents generally hold high expectations, despite their children's academic performance. However, recent literature has shown that Black boys are held to lower parental educational expectations when compared to Black girls, even when controlling for academic performance. Previous research has posited that concerns for heightened racial discrimination risk may explain this trend. Coll et al.'s Integrative Model for the Study of Developmental Competencies in Minority Children, states that ethnic minorities may adopt adaptive behaviors and beliefs in response to racially discriminatory experiences. These adaptations may additionally impact children's competencies. Although the influence of sociocultural factors on children's academic outcomes has been studied in recent literature, the possible association between parents' discriminatory experiences and their children's academic achievement remains largely unexplored. The purpose of the current study is to examine how parents' experiences with racial discrimination, parents' educational expectations, and children's educational expectations are related to children's academic achievement among Black Americans. The role of gender on the association between parents' discriminatory experiences and educational expectations will also be investigated. A negative association between parents' reports of discriminatory experiences and children's academic achievement was hypothesized. An additional prediction was that parents' and

children's educational expectations would mediate the association between parents' discriminatory experiences and their children's academic achievement. It was further anticipated that children's sex would moderate the relation between parents' discriminatory experiences and educational expectations.

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Political Science

A Person's a Person, No Matter How Small: How to Best Insulate Children from Abuse

Parental liberty, or the right to raise children with little to no government interference, can and does result in harm done to children. This is because the threshold for maltreatment of children that warrants government intervention is too high. The Supreme Court must enable States to return to what is known as the best-interest of the child standard concerning matters of child custody. Early Supreme Court jurisprudence builds to a case called Santosky v. Kramer. The cases pre-Santosky attempt to define what parental liberty ought to look like. Quilloin v. Walcott, a pre Santosky 1978 Supreme Court case, establishes the best-interest standard, which I believe must be reverted back to and expanded in order to better protect children. Santosky v. Kramer is what I consider to be a turning-point in the jurisprudence regarding parental rights. In Santosky, the Court defines the appropriate level of evidence that is required on behalf of the State in order to terminate parental rights, drastically heightening the requirements that states must meet. Santosky effectively kills the best-interest standard. Post-Santosky jurisprudence attempts to undo the damage done by Santosky, but ultimately fails by opening the door for a case called Troxel v. Granville. In order for states to effectively protect children, Santosky v. Kramer must be overturned, which would allow states to revert back to the best interest standard when determining the best placement for children involved with the DCFS system.

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Psychology

How Does the Psychological Sense of Community for International Students Become Disrupted During a Crisis?

The purpose of this research is to understand how international students experience psychological sense of community on American college campuses. In light of recent crisis such as the COVID-19 pandemic, the literature reviewed on the international student experience is applied to understand the specific consequences this population faced during the pandemic, and to provide an understanding for their experiences during other forms of crisis. Major findings include social support as being key to enhance an international student's psychological sense of community and combat the effects of crisis they experience. The final portion of this research includes suggestions for universities to explore and encourages the creation of a crisis management plan that emphasizes the inclusion of social support in social and academic settings at the university. Future

study will include focus groups of international students at St. Lawrence University to understand specific experiences and confirm suggestions proposed to the university.

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Social Psychology

Trends in Adolescents' Responses to Passive and Active Suicidal Ideation

As the suicide rate is increasing, especially for adolescents, research exploring young adults' reactions to peers disclosing suicidal thoughts is essential (Dunham, 2004). Friends serve as an extremely important confidant for adolescents because of trust, availability, emotional connection, and many other reasons. Identifying patterns in emotions and strategies reported by individuals, who were disclosed of suicidal ideation, shapes intervention trainings and suicide prevention mass education to meet the needs of the population. Along with this, disclosure can manifest in multiple ways, along with varying in intensity; investigating the different effects this has on responses is crucial to look at the bigger picture. Using interviews and the Mental Health Knowledge Questionnaire, this project aims to examine adolescent predicted response plans, feelings, and passive versus active variability. Suicide prevention coalitions are changing suicide awareness, understanding, and attitudes. As suicide prevention is encouraging help-seeking behavior, research is necessary to see how knowledge of suicidality translates to safety-prioritized action.

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Psychology

Relationship Between Student Beliefs and Perceptions of Future Success Among Students at an Ethnically Diverse Institution: A Preliminary Analysis

Student beliefs toward education could potentially be multifaceted. Their outlook on education has been associated with two attitudes or beliefs: abstract (belief in the power that education has in terms of future success) and concrete (belief that education does not guarantee success based on their experiences) (Mickelson, 1990). This study examined whether students of different racial and ethnic backgrounds at a highly diverse institution (Kean University) have similar concrete and abstract beliefs. The context of an ethnically diverse institution was used to examine whether a diverse school community influences the belief systems of students from various ethnic backgrounds. The results indicated that there is no significant difference between the participants of different ethnic groups on abstract beliefs. However, there was a significant difference found between the ethnic groups on concrete beliefs and perceptions of future success.

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Political Science

LGBTQ+ Hate Crime in America

Prejudice against LGBTQ+ persons have existed in the United States since America's founding, but we have seen that prejudice regularly erupts into violence in recent decades. Over the last two decades, the United States saw a national average of over 1200 reported hate crimes motivated by anti-LGBTQ+ bias. Furthermore, the LGBTQ+ community is disproportionately targeted by violent hate crimes compared to other minority groups in America. While bias-incidents targeting several American minority, groups have received considerable scholarly attention, a gap in scholarship aimed at empirically evaluating anti-LGBTQ+ hate crime and insecurity remains. Utilizing the FBI's UCR hate crime data from 2003-2017, we provide both a broad and critical empirical assessment of anti-LGBTQ+ hate crime statistics and the insecurity of the LGBTQ+ community. We systematically develop and present a series of different figures, tables, and graphs examining anti-LGBTQ+ hate crimes, including analysis of Regional; Population; Location; Offense Type; Victim Type; and Offender Type statistics. Among our most important findings, we show that the LGBTQ+ community is at a much greater risk of being attacked in locations where they gather socially. It is our content that this article provides foundational analysis for both scholars and practitioners interested in better understanding the insecurity faced by the LGBTQ+ community from reported hate crime in the United States.

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Environmental Science

Increasing Energy Access in Developing Countries Through Swarm Electrification and Localized Design

Global sustainability initiatives, hybrid system designs, and the affordability of renewable technologies have sprouted energy initiatives in developing countries. Despite global energy consumption reaching 23,696 TWh, millions of people in undeveloped rural regions lack access to electricity. Distributed hybrid systems maximize renewable resources, build resilience, and alleviate energy poverty. Microgrids have increased access but face challenges of large up-front costs and protection risks. Large entities have conducted suitability assessments that often leave out rural communities. Swarm electrification, a modular approach for development, offers a low-cost alternative through nanogrid interconnection. A techno-economic analysis follows an overview of non-technical threats that inform design. Nations with similar global rankings to Haiti are identified to pinpoint potential areas of design application. A study of a rural site in North Western Haiti indicated that a nanogrid capable of 50.66 kWh/day/7.32 peak will enable serving a local population of 200 residents. Modelling of the site using Hybrid Optimization of Multiple Energy Resources (HOMER) software suggests that optimal designs include solar-diesel generation and 100% solar architectures when accounting for diesel price volatility. The purpose of this paper is to provide a replicable process pathway for rural, nanogrid design in developing countries. Technologies are continuously lowering the cost of sustainable electrification through intermittent

strategies, decentralization, digitalization, and diversification. This study is a stepping stool for future study of nanogrid financial structures that boost financial stability and local manufacturing. Planned developments for the study site will explore the integration of social engineering to induce sustainable consumptive behaviors.

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Sociology/African American Studies/Social Science Education

Leaving No Black Child Behind: Effective Frameworks to Teach Black Children

What are some of the frameworks and approaches that educators and scholars have developed to teach and engage black students, especially in the years since the passage of the No Child Left Behind Act of 2002? This project will address this question by exploring three popular pedagogical frameworks designed with black students in mind: Hip-Hop pedagogy, reality pedagogy, and abolitionist teaching. Specifically, this project will highlight some of the primary tenets of each of these approaches and model some ways that each approach might be enacted in the classroom setting. In general, research on effective ways to teach black students has focused on inclusive ways that nonblack teachers can engage black students, and the most effective strategies for structuring and disciplining classrooms. This project will contribute to this research by comparing and contrasting three of the most popular race-conscious pedagogical frameworks, with attention to how inclusive they are to black students' engagement in the classroom, how they account for the limits and challenges of classroom instruction, and how they affect teacher perspectives about students and classroom instruction. Ultimately, this work will raise important questions about how to best accommodate the unique perspectives, lived experiences, and aspirations that black students bring to the classroom.

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History

19th and 20th Century Mexican Identity: Expressing Gender and Culture Through the Arts

In 19th and 20th century Mexico, marianismo was the term used to refer to women as ideal. In the mid 20thcentury, women began to enter the art scene, joining the male dominated field. Artist Frida Kahlo and musician Ángela Peralta individualized their identity as mexicanas who stood out from the revolutionary ideal woman with their talent and skill. They influenced other women to express their individual identities, shifting away from what society and politics idealized. The Mexican Revolution caused society to distance itself from the terms marianismo, machismo, and buenas costumbres. It is important to argue that Mexican art and music is impactful on society because it addresses the issue of gender and cultural identity. This research continues the conversation of powerful women in the art and music industry and their influenced over young women in the popular culture. The research uses scholarly articles and books, websites about modern artists influences, a movie about a famous artist in Mexico, and artwork that portrays women's rights.

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Biomedical Engineering

Classifying Diminutive Polyps by Convolutional Neural Networks

Though colorectal cancer is the one most preventable forms of cancer, the Center for Disease Control (CDC) estimates that it accounts for more than 50,000 Americans deaths per year, making it the third leading cause of cancer-related deaths in the United States. As with many other forms of cancer, colon cancer is classified by its stages beginning with Stage 0 and Stage I and climaxing at Stage IV. In its earliest stages, Stage 0 and Stage I, colon cancer treatment is most effective, which makes screenings essential. Screenings, such as colonoscopies, allow for the detection of precancerous polyps, which are abnormal growths that form in the colon or rectum. However, these procedures can become quite costly, ranging from $2,000-4,000 if a patient is uninsured. In efforts to reduce costs and add to the efficiency of the procedure, Dr. Keith Schubert's lab and Dr. Themistocles Dassopolous of Baylor Scott and White Health are using machine learning to detection diminutive polyps (<5mm) and identify potentially cancerous adenomatous polyps from harmless hyperplastic polyps. Adenomatous polyps should be resected and the frequency of screening exams must be higher. Accurately distinguishing (>90% accuracy) between harmless hyperplastic polyps and adenomatous polyps that possess characteristics of advanced neoplasia would remove the need for a pathologist to biopsy the polyp thus significantly reducing the cost and increasing the availability of the procedure while maintaining the procedure's integrity. One potential solution to this issue has been to use a convolutional neural network (CNNs), via Matlab, to train a machine to differentiate images taken during a colonoscopy to identify harmless polyps and those that need to be resected. Results are pending the conclusion of the experiment.

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Clinical Psychology

Child Temperament and Work Productivity in Parents of Preschoolers During COVID-19

Few studies have examined the relationship between home factors and work productivity for parents. The purpose of this study was to identify whether there was a relationship between child temperament and work productivity for parents of preschoolers during COVID-19—a period during which the work and home environment was disrupted (e.g., increased frequency of telecommuting, children completing school from home).A total of 52 parents of preschoolers (ages 2-7) were asked to report on both their child's temperament (i.e., the Child Behavior Questionnaire) and their personal work productivity (i.e., The Endicott Work Productivity Scale). Results indicated no relationship between overall temperament and work productivity. However, when mothers and fathers work productivity was examined separately, there was evidence that children's extraversion temperament was related to fewer work productivity issues, but only for fathers. This work suggests that work productivity may be related to factors not only related to the office setting, but consideration of family factors for parents may be important as well.

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Nursing

Associations Among John Henryism Active Coping and the Mental and Physical Health of African American Women: A Scoping Review

One of the biggest health issues currently plaguing African American women is maternal morbidity and mortality, with one-third of maternal conditions being caused by heart disease and stroke. Previous research has shown that John Henryism Active Coping (JHAC)negatively impacts the cardiovascular health of African Americans, often leading to hypertension that is induced by active coping. Literature related to John Henryism and its effects on the health of African American women remains mixed, with most studies proving that the construct is a protective factor for hypertension and depression. In this study, a scoping review based on Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) guidelines was conducted to summarize the results of previous studies examining John Henryism and its association to the well-being of African American women. My results support the notion that John Henryism may be a protective factor against hypertension and depression, as most studies that were reviewed mentioned its positive effects on mental and physical health. I recommend future research on John Henryism and the implications that it may have on African American women's health, as it may be a protective factor for maternal morbidity and mortality.

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Psychology

Bidirectional Association of Daily Stress and Nightmares

Nurses may experience nightmares due to their stressful work environments and frequent exposure to trauma. At the same time, nightmares may exacerbate next-day stress. These links have yet to be investigated in daily life. To address these gaps, we examined the daily bidirectional associations between stress and sleep and moderation by posttraumatic stress disorder symptoms among nurses. Participants were 392 nurses (92% female; 78% white, mean age = 39.54) who completed 14 days of morning sleep diaries to assess daily stress and nightmare frequency and severity. Posttraumatic stress disorder (PTSD) symptoms were assessed at baseline. Days with greater stress severity were associated with higher odds of experiencing a nightmare that night (OR = 1.22, p = 0.001), as well as greater nightmare severity (b = 0.09, p = 0.033). Nights with more frequent (b = 0.09, p = 0.003) and more severe nightmares (b = 0.08, p = 0.002) were also associated with greater next-day stress severity. Baseline PTSD symptoms did not moderate any within-person associations. Nightmares and stress may occur in a bidirectional fashion in daily life, even among those who do not meet criteria for PTSD. Given that nurses face high levels of workplace stress and trauma, targeting sleep may be one means to improve their well-being. Future studies may benefit from examining how specific types of stress and trauma affect other facets of sleep among nurses and other at-risk populations.

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Psychology

Texas vs. New Mexico: Efficacy of Drug Possession Mandatory Minimum Sentencing

American federal drug policies define the parameters for the entire country, outlining what is lawful and what is not. Over the last 20 years however, power has shifted from the federal level to the states, causing serious variance within certain policies across state lines. One instigator of change has been the social advocacy for decriminalizing the use of substances, or adjacent legal repercussions for someone charged with possession of an illegal substance. On a similar vein, when Colorado legalized recreational cannabis in 2012, it again highlighted legal disparities across state lines that has since led a change in substance use policy in other states. While states have initiated change, there has been a consensus in the south to follow federal protocol for substance abuse. This paper will compare Texas and New Mexico's drug related policies using the critical policy analysis to examine the efficacy of each policy in regards to their goals.

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Biology

Refining Assay Recipes to Measure Immunological Responses

Immunology is the study of how organisms protect themselves against pathogens. The way the host's body responds to pathogens is by using specialized cells and proteins to attack invaders, collectively called the immune system. Vertebrate immunology is an extensively researched area of biology; however, the innate immune response of invertebrates is still not well understood. For example, it is unclear if the cost of activating an immune response differs among species with conserved immune pathways, and therefore if similar colorimetric immune assay protocols can be utilized across taxonomic groups of invertebrates to produce similar results. The two species studied in this project are Tigrosa helluo (a wolf spider) and Apis mellifera ligustica (the Italian honeybee). Because both species differ biologically, the same assay recipe may not be well-optimized for both organisms. This project aims to develop optimized assay recipes specific to each species for enzymes used with invertebrates when mounting an immune response including prophenoloxidase, and the antioxidants peroxidase and catalase. Once the assays have been optimized, it is hypothesized that the spiders will have lower levels of enzyme activity proportional to body size when compared to bees. Because bees have a more social lifestyle, one can infer that their innate immune system is constantly being utilized due to community transmission of pathogens. In comparison, cursorial spiders primarily live a solitary lifestyle, and thus are predicted to have a lower frequency of immune challenges that would consequently increase immune enzyme activity.

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Behavioral Neuroscience

The Social Competence, Self-Perceptions, and Quality of Life of Autistic Adults

Autism Spectrum Disorder (ASD) is a neurodevelopmental disorder characterized by impairments in social communication, social perception, and maintaining social relationships. Traits of ASD are often observed and diagnosed in early childhood but are present throughout the individual's entire lifetime. However, most of the literature focuses exclusively on children and adolescents, largely excluding adults. This narrow focus results in limited information on the functionality of support networks and social relationships for autistic adults. This study will investigate the social competence and self-perception of autistic adults to determine overall quality of life and any areas in need of more support. An online survey assessing social competence, self-perception, and quality of life will be created and disseminated on social media to reach a participant sample of 50 autistic adults, aged 18 and older. This research will help to identify the difficulties that autistic adults face in their lives, social relationships, and self-perceptions

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Public Health/Economics

An Examination of Disparities in Healthcare: Analyzing the Influence of Race on Outcomes of Emergency Room Visits

This research project aims to examine disparities in healthcare despite the advances in modern technology and medicine today. In the midst of the COVID-19 pandemic, such disparities have been further brought to light. This racial disparity analysis was focused on the emergency room setting. A literature review was conducted to collect a current understanding of the topic which revealed that racial minorities, which were often times Black/African-American people, were observed to experience adverse health outcomes and experiences compared to White people. Data from the National Health Interview Survey (NHIS) was collected using the Integrated Public Use Microdata Series (IPUMS) database. The dependent variable measured whether or not patients received care following a visit to the emergency room. The main independent variable of focus was race and was grouped into four categories: Black, White, Asian, and Native Indian. Other independent variables included were marital status, region, gender, age, and health status; data was collected from years 2015-2017. A regression analysis of our estimated model revealed that Black patients were on average 8.98% more likely to receive care from the emergency room compared to White people. These findings demonstrate a different pattern than of previous studies and may suggest that progressive work towards eliminating racial disparities in healthcare has been accomplished. Concurrently, this can also prompt questions that suggest there may be other reasons behind our findings such as whether or not Black people have higher rates for using the emergency room due to lack of access to primary healthcare.

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Neuroscience

Investigating the Effects of Prenatal Stress on the Regulation of Unc-33 in C. Elegans

Jeopardized genetic and environmental factors such as the disruption to the mTOR signaling pathway and prenatal stress are hypothesized to lead to the development of Schizophrenia. Researchers Lee and colleagues determined that rats exposed to prenatal stress have decreased levels of DPYSL2 in the cortex and hippocampus and develop schizoid-like behaviors. DPYSL2 is important for axonal outgrowth, neuronal differentiation and microtubule organization. The C. elegans homolog of DPYSL2, UNC-33, is also important for proper axonal formation and microtubule-mediated trafficking. To test the hypothesis that environmentally induced prenatal stress affects neuronal expression of UNC-33/DPYSL2 and thereby interfere with the development of a normal circuitry, we studied an unc-33 transcriptional reporter. First, we crossed a strain containing a transgene with the unc-33 promoter driving GFP with mutants possessing varying levels of autophagy, a molecular pathway activated in response to nutritional stress. Next, we grew nematodes under conditions of high temperature or conditions of induced autophagy and monitored GFP expression using confocal microscopy. Analysis of the level of expression of the unc-33 transcriptional reporter denotes that neuronal expression is decreased in animals developing at high temperature and in those with reduced autophagy. In the case of high temperature, we observed that as high temperatures negatively impact the GFP expression in neurons, glial expression of GFP is increased. Taken together, these observations suggest that temperature and levels of autophagy have the potential to regulate expression of unc-33 in vivo by negatively modulating its transcription in neurons, a phenomenon aligned with the development of Schizophrenia.

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Health

Quanitfying Health Attitudes and Access in U.S.-born and Immigrant LGBT+ Latinx People

According to the Pew Research Institute, there are approximately 44.4 million immigrants, a vast majority of whom identify as Latinx. Out of this number, 2.4 million, both undocumented and documented, identify as LGBT+ as well. Economic, social, and political factors, especially those racialized against Latinx people and discriminatory towards LGBT+ people, contribute to deleterious effects in the lived experiences of LGBT+ Latinx people in the United States. Specifically of interest within this project are the various factors and their subsequent effect on the health access in this population, as measured by access to primary care and perceived attitudes towards health services. Additionally, an investigation into the ways immigrant policing impacts skepticism in health service utilization within LGBT+ Latinx people will be performed. Such immigrant policing has been suggested to decrease enrollment in public health programs meant to increase health access in this subgroup. To accomplish this study, data from patients of the Seton Healthcare Family, a Catholic medical network in the Greater Austin area, will be collected through interviews

and survey intake. This project aims to identify the critical areas of need within the LGBT+ Latinx immigrant and U.S.-born population.

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Psychology

Positive Self-Perception and Memory

Previous research and studies have shown that positive affirmation such as flattery or compliments has an effect on memory. Whether from a person or device, positive affirmation stimulates cognitive development. The effects of this stimulation can cause motivation, enhance ability, and boost your self-esteem. Previous research also suggests that it can even improve memory recall. Even though previous studies and research shows that positive affirmation does have an effect on memory recall, it doesn't express the difference of variance within the levels of positive affirmation given; that being the gap in the literature. In order to determine if self-positivity over three various levels has an effect on participant's recall memory, (N=49) UT undergraduate students were recruited. Participants were assigned to one of three conditions that varied in the number of positive affirmation quotes received. Participants read a short vignette passage, completed a distractor task, and were asked to recall details based on the passage they read. Based on the results, there was no statistical difference in the amount of self-positivity participants received on detail recall memory. These results did not support my original hypothesis which was that higher levels of self-positivity (multiple quotes of positive affirmation) would improve detail recall memory. However, I did find that women performed better than men. Based on this finding, future research should further investigate the effects of self-positivity and the difference in memory recall between men and women.

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Geology

Chemical Weathering of Deposits from the 1980 Mount St. Helens Eruption and its Effect on Stream Water Chemistry

Chemical weathering is an ongoing natural phenomenon that aids in the breakdown of solid rocks, and contributes to the chemistry of natural waters and soils. Therefore, studying chemical weathering in a given area may provide a better understanding of the natural influencers on nearby water chemistry. The eruption of Mount St. Helens (MSH) in 1980 provides a unique opportunity to study the chemical weathering of young rocks which typically weather more rapidly than older rocks. The aim of the study was to determine the relative resistance of the volcanic rocks from the 1980 MSH eruption to chemical weathering by using a sequential leaching process. Sediments were collected from the streams and leached with the following solutions to simulate chemical weathering: ultra-pure water (H2O), 1 N acetic acid (CH3COOH), and 1 N nitric acid (HNO3). The leaches were analyzed for Ca, Na, K, Fe, Mg, and Al using an inductively coupled plasma optical emission spectrotrometer (ICP-OES). Results show that each successive leach was capable of

breaking down more resistant minerals. Future research includes interpreting the composition of the leaches to determine which minerals each removed from the stream sediments.

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Psychology

The Challenge of Reporting Growth Following Trauma

Posttraumatic Growth (PTG) refers to positive psychological changes that result from a traumatic experience. The Posttraumatic Growth Inventory (PTGI) is the most commonly used measure of PTG. This measure contains only positively worded items such as ¨I have a greater feeling of self-reliance¨. Interestingly, another measure called the Posttraumatic Cognitions Inventory (PTCI), which assesses a person's negative thoughts and beliefs following a trauma, contains similar questions to the PTGI. Questions on the PTCI, however, are all negatively worded. The PTGI and PTCI should have a strong negative correlation. The purpose of our study was to examine the relationship between these two measures using a large sample size. We hypothesized that the PTGI and PTCI would have a negative correlation. We analyzed data from 1,478 participants from the University of North Texas who completed the PTGI and PTCI. The results indicated a small but significant positive correlation between these two measures, which was the opposite of our hypothesis. These results add to current research questioning the validity of the PTGI.

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Harding University, with Dr. Jeremiah Sullins
Psychology

The Relationship Between Religiosity and Mental Health During the COVID-19 Quarantine

Social isolation has become a public policy under the current circumstances. This isolation can lead to a life imbalance that is believed to affect physical, psychological, and spiritual well-being. Previous research shows that both, a defined sense of religiosity or affirmative secularity, can yield progressive emotional outcomes due to multiple factors such as community support, sense of structure, life guidance, mindfulness and a sense of unity with the world. However, a gap exists in the extant literature regarding the relationship between mental health and religiosity during global pandemics. In order to address this gap, this study sought to answer the following question: Does religiosity significantly affect mental health in those that have reported being impacted by COVID-19? The present study found no statistically significant differences in the levels of anxiety or depression as a function of religiosity. There also was no significant correlation between anxiety and the different dimensions of religiosity or depression and religiosity.

Brian Gyamfi, briangyamfi@utexas.edu
The University of Texas at Austin, with Dr. Repp and Dr. Youngstrom
Psychology

Mood Disorder and Creativity Across Culture

Throughout history, mood disorders have been associated with artistic creativity. The term "mad genius" stems from the belief that a relationship between creativity and mood disorders exists. There are many examples of striking associations between creativity and mood disorders, and particularly bipolar disorder. There have been many creatively acknowledged people who have suffered from mood disorders: Vincent Van Gogh, Sylvia Plath, Martin Luther, Ernest Hemingway, and Winston Churchill, to mention a few. Researchers have conducted studies regarding the association between mood disorders and creativity, but rarely has the research been applied outside the United States. A great deal of the research reported to date has also been relatively narrow as it has focused mostly on writers. Cultural relevancy regarding creativity and mood disorders has also failed to be taken into account. We hypothesized that, depending on to the Country the participant resides the correlation between mood disorder and artistic creativity will differ. In this study, I am working with Dr. Youngstrom and Dr. Repp to use data gathered by Dr. Youngstrom and Dr. Rizvi for From South Korea, North America, and India to conduct a secondary analysis using R Studio of the specific variables.

Sarah Hale, sarah_hale1@baylor.edu
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Psychology

Authenticity and Virtue in Political Discourse

Although emerging research reveals a link between virtue and the feeling of being who one truly is (i.e., subjective authenticity), there has yet to be an investigation of virtue theory in the context of philosophical constructs and its implications on the literature. Philosophers might question whether existing social psychological measures of virtue accurately capture virtue as a virtue theorist would recognize it. This project addresses this limitation by employing an innovative method to assess the expression of civic virtue. A total of 244 college aged participants responded to purported social media style posts and comment threads about various partisan topics. Participants' narrative responses to these threads were recorded and coded for the expression of civility based on a coding scheme developed by psychologists and a virtue theorist. After each post, participants completed a measure of state authenticity. We hypothesized that participants would feel more authentic following "posts" that expressed greater civility. Results instead pointed to uncivil political discourse leading to authenticity. This suggests that links between authenticity and virtue expression may be different than what current literature suggests, which could be due to methodology.

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Psychology

Gender Differences in Cultural Mistrust and Mental Health in the Black Community

This study will examine the relationship between cultural mistrust and the mental health of black men and women (n=408). Given that previous research has shown a correlation between cultural mistrust and help seeking behavior in a variety of cultures, we want to examine how the intersection of race and gender impacts the relationship between mental health and cultural mistrust in Black Americans. Results from our independent sample t-test, correlation analysis, and anova indicate significant gender differences in the effects of cultural mistrust and overall mental health in Black Americans. Higher rates of cultural mistrust were significantly correlated with lower mental health averages. Black women from our study had higher rates of cultural mistrust and lower mental health compared to Black men. Implications for further research analyzing mental health in the Black community will be further discussed.

Tristan Henderson, hendersontc@hbu.edu
Houston Baptist University, with Dr. Agnieszka Czopik
Molecular Biology

What did the first animal look like?

Sponges or ctenophores are thought to be the most basal animals alive, which zoologists' study to figure out the origin of animals. The lack of model organisms representing the "first animal" makes this difficult to figure out. The other side of this problem remains understudied; what did the ancestors to animals look like? All animals are multicellular, but they had to have evolved from unicellular relatives. This creates an ill-defined border between unicellularity and multicellularity. On the unicell side, there have been new discoveries of protists that are evolutionarily close to animals. These protists and animals make the group Holozoa. Studies involving these protists have yielded more nuanced answers to animal origins. However, one problem is the lack of field research and discovery of new species. The literature suggests novel holozoan biodiversity around certain parts of the world. Some are free-living in oceans or rivers, and others are known to be parasites. Holozoan protist diversity in the mid-south of the United States is unknown, and no one has isolated novel cells from this area. My project involves sampling nutrient-rich areas in Texan rivers for broad testing of holozoan protist diversity (using metabarcoding), followed by developing a method to isolate free-living species. Finding and culturing single cells is quite difficult but exploiting their lifestyle may provide a solution. This project was greenlighted before the pandemic with intent of progress now. However, we have only started sampling and metabarcoding processes. Thus, the presentation will involve findings in the field so far.

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University of Wisconsin - Oshkosh, with Dr. Brian Wallace
Kinesiology/Strength & Conditioning

The Effect of Timing, Program Design and Factors in Complex Training

The Effect of timing, program design and factors in Complex Training. - The purpose of the present research is to examine and understand the effects of timing, program design, and factors in complex training. The concept of complex training is the combination of traditional resistance training and plyometric training which aims to improve strength and power aspects of individuals. With 16 participants (15 males, 1 female), a complex training program will be completed while 15 participants (15 males) complete a traditional resistance training. All participants will be assessed using maximum squat, vertical jump, sprint stair power test, and anthropometrics. After the assessments are completed, a 9-week training program will be performed that increases intensity and workload. After the program, the assessments will be reevaluated to determine significant differences from pre-program to post-program. The assessments will determine differences in power, speed, and strength. All of which will help to determine if the rest periods and program design (ex. Exercises, sets, repetitions, etc.) are beneficial for individuals. Hypothesize that the complex group will perform better or the same as the control group. The importance of this research is that the timing of rest periods is different along with the exercises compared to other studies done. Another important factor is that it is done on collegiate wrestlers. Due to COVID-19, the experiment will be postponed until circumstances change.

Andy Hims, ahims16@stlawu.edu
St. Lawrence University, with Dr. Ana Estevez
Biology/Neuroscience

Alzheimer's and the Aging Brain

Alzheimer's disease (AD) is a progressive neurodegenerative disorder that causes neuronal loss and was initially characterized by Dr. Alois Alzheimer to have the histopathological hallmarks of _-amyloid plaques and neurofibrillary tangles. From these observations, the current hypotheses for the etiology and treatment of AD were deduced, centering on proteopathic cascade hypotheses such as the _-amyloid cascade hypothesis and the phosphorylated-tau hypothesis. While these hypotheses have been supported with pharmaceuticals targeting these on animal models demonstrating promising results, all have failed to produce the desired result in human clinical trials. Because of this, proteopathic hypotheses have been increasingly questioned and other hypothesis are beginning to appear such as the accelerated aging hypothesis. The accelerated aging hypothesis claims that AD is not unique in its set of contributing factors, rather they are characteristic of neuronal aging, and are found earlier at an accelerated rate in AD. If that is the case, then studying the etiology of AD must begin by studying the hallmarks of aging to see how aging may contribute to neuronal and synaptic loss in AD. By formulating an extensive literature review focused on building connections between Alzheimer's and aging, I come to the conclusion that the accelerated aging hypothesis can serve as a unifying hypothesis, combining elements of the proteopathic hypothesis into a single idea to describe AD. This oral presentation will focus on critiquing the current situation of the proteopathic hypotheses and analyzing how aging may be

regarded as a unifying hypothesis for AD.

Jasmine Jackson, jjackson5@harding.edu
Harding University, with Professor Jackie Harris
Nursing

Pediatric Bullying Education in Baccalaureate Nursing Programs in Arkansas

Over the years, there has been an ever-increasing spotlight on the issue of bullying among adolescents. Nurses are another adult-figure, in addition to parents and teachers, that can help identify and address bullying if educated properly; however, there is minimal literature present about pediatric bullying education within nursing programs. The purpose of this study was to examine pediatric bullying education in Arkansas baccalaureate nursing programs. Through the use of a mixed-method approach, the newly created survey was to be completed by one faculty member from each of the 12 Bachelor of Science in Nursing (BSN) programs in Arkansas (12 participants; 6 respondents). The research describes the quantitative and qualitative data analysis from this non-experimental descriptive pilot study. Results displayed a positive perception among nursing faculty about pediatric bullying education; however, the occurrence (n=3; 50%) and the inconsistent and non-specific nature of pediatric bullying education in Arkansas baccalaureate nursing programs indicates a need for further knowledge and research over the topic for more conclusive findings.

Victoria Jaimes, vjaimes1@stedwards.edu
St. Edward's University, with Dr. Kadie R. Rackley
Psychology

The Power of Authenticity in a Diverse Workplace

Authenticity has recently emerged as a buzz word in practice and science. For companies, authenticity develops a work culture where people feel more in tune and connected to their work community and loyal to their organization and its purpose. The current study will investigate patterns of association between authenticity at work and wellbeing among various ethnic groups. Participants will complete the Authenticity Scale (AS), Authenticity in Relationships Scale–Multiple Contexts (AIRS-MC), Warwick-Edinburgh Mental Well-Being Scale (WEMWBS), and related measures through an online survey. The purpose of the study is to better understand the relationship between authenticity and wellbeing among working individuals in a diverse working climate.

Viviana Jaimes, vjaimes3@stedwards.edu
St. Edward's University, with Dr. Lori Peterson
Sociology

The Effects of News Media on Social Trust and Well-Being in the Latinx Community

Levels of social trust and well-being within the Latinx community were investigated when

presented with negative or positive media clips, posts and excerpts about their community. Latinx Community volunteer participants, ages 18-25, took a pre-test survey to determine initial levels of well-being and social trust, followed by viewing and reading positive or negative media clips and excerpts about their community. Negative clips included: (1) an example of Latino underrepresentation in Hollywood, (2) clip of a Tucker Carlson guest warning that Democrats are trying to replace whites with Latinos to "transform the United States," and (3) an excerpt about how Latinos should not speak Spanish in public places. Positive examples included: (1) Latin music is more popular than country and Electronic Dance Music (EDM) in America, (2) Latinos may be the key to future US economic growth, and (3) how speaking Spanish brings a competitive edge. A post-test was administered to determine changes in levels of well-being and social trust. It was predicted that those who viewed negative clips, posts and excerpts would report lower levels of social trust and well-being and those who viewed positive clips, posts and excerpts would report no change in levels of social trust and well-being.

Aaron Kinard, akinard@wisc.edu
University of Wisconsin - Madison, with Dr. Linn Posey-Maddox and Dr. Walter Stern
Sociology/Education

Rural Education: Black Students' Descriptions and Understandings of Racialized Experiences in Rural, Predominantly White High Schools in Wisconsin

This research study explores the racialized experiences of Black students who formerly attended rural, predominantly white high schools in Wisconsin through qualitative research methods including semi-structured interviews with a sample size of forty Black individuals. At a time in which racial demographics are increasing across rural America and prior research reveals that Black students attending predominantly white schools encounter racial microaggressions and racism, this study seeks to explore the racialized experiences of Black students navigating rural, predominantly white institutions. Through semi-structured interviews, this research will explore how the former students describe the racial climate of their former high school, how racialized experiences in and outside of school impacted their sense of belonging to their former school, and how their experiences shaped their perceptions of Blackness. It is based upon the experiences of Black students navigating other predominantly white spaces that this study hypothesizes that individuals will report their former high schools having a hostile racial climate and that they experienced microaggressions and racism in and outside of school. As a result of these experiences, we suspect they will report lacking a sense of belonging to their former school. The anticipated findings from this study hope to highlight the racialized experiences and needs of Black students in these spaces and help inform educators, administrators, and policymakers. This research study is funded by the Ronald E. McNair Scholars program and is co-mentored by Dr. Linn Posey-Maddox and Dr. Walter Stern of the Department of Educational Policy Studies at the University of Wisconsin-Madison.

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University of Wisconsin - River Falls, with Dr. Daniel Ehlinger
Neuroscience and Psychology

Amelia's Anxiety: A Case Study of the Development of Anxiety Disorders in Adolescence

Adolescence is emerging as a newly discovered and separate critical period of brain development. Many structural and chemical differences are seen throughout this critical period, many of which can deviate from typical developmental patterns. One such atypical development during adolescence is the development of anxiety and other mood disorders. The adolescent brain is typically characterized by an increase in white matter, due to myelination, and a decrease in grey matter, due to synaptic pruning. These changes are primarily present in adolescence, thus making it distinct from childhood and adulthood. Amelia's story of anxiety is fictional but draws from multiple primary research articles. Case Studies are used to promote active learning in the classroom. The case was taught in an online classroom environment, but it can be adapted for a "flipped classroom" setting with multiple discussion opportunities as it is in an interrupted narrative format.

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University of Wisconsin - River Falls, with Dr. David Zlesak
Horticulture

Determination of Rosa Hybrida Floral Part Number Stability Based on Time of Season and Flower Position in Inflorescence

The variation or stability for petal, anther, and pistil number within flowers is unclear between flowers within an inflorescence and also over the growing season for cultivated landscape roses (Rosa hybrida). Having stable petal number across blooms would be of value to provide consistency in floral effect no matter the bloom time or bloom position. In this research flower part counts were conducted in the beginning (June), middle (July), and end (August) of summer along with primary and secondary blooms within inflorescences at each date to see if these factors impacted floral part counts. Six roses were used in this study: Carefree Beauty™ ('BUCbi'), Cherry Frost™ ('OVEredclimb'), Music Box™ ('BAIbox'), Kiss Me™ ('BAIsme'), Polar Express™ ('KORblixmu'), and 'Sven'. The samples were collected at Lyndale Park Rose Garden in Minneapolis, MN. The samples were collected and counted, and the data is graphed to help identify trends of the floral part counts across inflorescences and as the season progressed. With the completion of the data collections, it was found that the data was somewhat inconsistent. At times and with some cultivars, the anticipated results of reduced petal and other flower organs between the primary and secondary blooms and over the growing season were observed. For other roses little differences were found or even an increase in the floral organ counts as the season progressed. This research was completed with the acknowledgement of Dr. David Zlesak, the University of Wisconsin-River Falls Ronald E. McNair Program, and the Lyndale Park Rose Garden.

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University of Wisconsin - River Falls, with Dr. Erik Withers and Kirsten Lindbloom
Sociology and Criminology

Perceived Employment Desirability of Non-white, Non-heterosexual Women: The Influence of Social-Vocational Comfortability

With slowly increasing protection related rights for women, persons of color, and the LGBTQI+ community, there is need for further research as previously non-visible members of the community emerge as visible. Previous research shows that marginalized communities are oftentimes viewed as less desirable applicants within the career sector based on social-vocational comfortability of other employees and consumers of services. However, what this previous research does not fully address is how multiple intersecting identities may affect translation into overall perceived employment desirability of perspective applicants. Therefore, the purpose of this study is to measure perceived employment desirability among non-white, non-heterosexual women. Data for this research project was collected using a survey with both qualitative and quantitative components. Participants for the study (n=43) were acquired using a convenience sampling of populations including students within higher education settings and direct care professionals currently working within a therapeutic setting. Results on the basis of whiteness, when transferred into a visible minority status, shows decreased functions as a protective factor within the social world. Those within caring industries, to no malicious fault, are still susceptible to colorblind tendencies such as utilizing experience and education as primary influences of candidate desirability with gender, or race and ethnicity as secondary or supportive influences behind candidate selection. The results produced by this study should be considered significant for organizations as well as instigate further critical analysis on intersectionality and its corresponding disparities of employment desirability of non-white, non-heterosexual women applicants.

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The University of Texas at Austin, with Dr. Rachel Gonzalez-Martin
Mexican American & Latina/o Studies

Visual Forms of Transformation and Resistance: A Close Reading on East Austin's Murals

This presentation will engage community murals as text in order to examine the relationship between public art and low socio-economic Mexican American communities. In communities under threat of gentrification, environmental disruptions, and cultural history loss, murals represent resistance as huellas or markers of social and environmental transformation. I analyze murals such as "Liberacion" by Raul Valdez, "Our Lady of Guadalupe" by Juan Ruiz, and "Lotteria" by Johnny Martinez and its restoration by Arte Texas. These east Austin murals create relationships between community members, locations, history, and narratives. This study foregrounds the role of murals as indicators and catalysts for environmental and social change within their communities. Utilizing Kay Turner's, "Voces de Fe: Mexican American Alaristas in Texas," this study will compare the use of altares to murals, indexing spirituality as a defining transformative quality of murals. In order to demonstrate this, I created a geo-social map of select murals in East Austin from 1997-present. The maps will provide an artistic timeline and also allow for the visualization of change in the

communities. And a thorough analyses of public mural art, “Liberacion,” “Our Lady of Guadalupe,” and “Lotteria,” with a biography of the artist and a brief history of their location. For the close reading of the murals, this study will use photographs from fieldwork done in east Austin in which I photographed murals and observed their function in their locations.

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Baylor University, with Dr. Jason Pitts
Biology

Olfactory Detection of Antioxidants and Geosmin in Beetroot with Female Aedes Aegypti and Their Effect on Oviposition

The highly anthropophilic Aedes aegypti (Linnaeus) mosquito is the principal vector of arthropod-borne viruses, including dengue, yellow fever, chikungunya, Zika and has become a burden to global health due to their wide geographical distribution. A critical component for female mosquitoes to successfully select oviposition sites is to detect volatile compounds present in natural and artificial water-holding containers in which they establish as breeding sites. Recently, beetroot has shown to act as an affordable novel attractant due to geosmin and dietary antioxidants, which can potentially mediate oviposition. In our lab, we investigate the behavioral responses of female Ae. aegypti to hydroxycinnamic acids (HCAs) and geosmin present in beetroot to understand the role of olfactory sensory detection of antioxidants and signals for microbial populations. We established the inconsistency of beetroot over traditional attractants with several trials of oviposition assays and demonstrated that female mosquitoes do not respond to polyphenolic antioxidants directly, which are necessary for counteracting oxidative stress induced by consumption and infection of pathogenic microorganisms. Future work consists of measuring the behavioral response to ethylphenol, which are exclusively derived from HCAs, to observe if the volatiles can act as proxies for antioxidants and if mosquitoes are equipped with olfactory sensory to detect these dietary compounds. The research goal is to observe if females actively seek out antioxidants associated with microbial by-products to understand the role of olfactory detection in oviposition while establishing beetroot as a cost-effective alternative for mosquito trapping.

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University of Wisconsin - River Falls, with Dr. Natasha Rayne
Soil Science

Evaluation of Dairy, Turkey Manure, and Digestate on Soil Fertility and N Leaching in Field Corn

This research focuses on measuring any differences in nitrogen uptake by field corn plants due to the source of supplemental nitrogen: manure or digestate. Corn requires about 150 pounds of nitrogen per acre to support plant growth. Dairy manure supplies about 10-12 pounds of nitrogen per ton. Turkey manure can supply up to 27 pounds of nitrogen per ton. Applying a digestate is an acceptable source of nutrients, but little research shows the comparison to manure sources. We evaluated soil organic matter, pH, macronutrients, micronutrients, cation exchange capacity, bulk density, and microbial activity in soil to compare effects of manure to a digestate. Using a 4,200

square foot field, divided into 18 ten x five-foot test plots, we applied six treatments (one control (no application); three manure treatments (at the rate of: 10 tons/ac dairy manure; 2.5 tons/ac turkey manure with oat hull liter; and 2.5 tons/ac turkey manure with wood chips) and two separate digestate treatments (the first at the rate of 61 gallons/plot (approximately 53,000 gallons/ac) in a single application and the second at the rate of 122 gallons/plot (approximately 106,000 gallons/ac) in a single application). Each treatment was applied to three separate test plots. Throughout the study, we took soil samples (pre-plant, V5, V10, and VT at 0-6"and 6"-12" depth). Tissue samples were taken at V5, V10, VT, and at harvest time. Manure and digestate were analyzed for macro nutrients before application.

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St. Edward's University
Religious Studies

Emptiness in the East and West: Nagarjuna and Jean-Pierre Duprey

The doctrine of sunyata is among the many principle teachings of Buddhism. It asserts the belief that everything is inherently empty because nothing is substantial to arise by its own nature. One of the first and highly regarded thinkers to systematically develop sunyata is Nagarjuna, a late second century CE Buddhist monk and scholar. In his identification of sunyat (also translated as voidness or emptiness), Nagarjuna will argue against the problems of reality, language, and identity. The approach to these problems is cognate to the development of the artistic and literary movements of early to mid-20th century Europe. One of the predominant movements of that era was Surrealism, and within this group was a young post-WWII poet whose expressions of the void are cognate to Nagarjuna's sunyata. Therefore, a comparative analysis between Nagarjuna's sunyata and Duprey's work is called forth to investigate a correlation between their understanding of the void. This research will examine the expressions and similarities found between Nagarjuna's sunyata and Jean-Pierre Duprey's poetry that may generate a language of voidness that is cross-culturally understood between Eastern and Western audiences.

Andrew Lindbloom, AndrewLindbloom_Lin1@baylor.edu
Baylor University, with Dr. Alan Schultz
Anthropology

The Social Networks of Forager-Horticulturalists Entering the Market Economy

Comparative research on the integration of subsistence societies into market economies demonstrate that social relationships are often profoundly affected, with implication for health inequalities. What role does culture take in the transition into the market economy, and what might variation in social structures mean in a cultural evolutionary context? This ongoing exploratory research study uses Social Network Analysis (SNA) methods and empirical survey data to determine whether market integration is quantitatively associated with the social networks of Tsimane' forager-horticulturalists in Bolivia. Despite having some of the best metabolic and heart health ever measured, study of the cultural lifestyle of the Tsimane' remains limited. Findings suggest that a nascent process of market integration already underway in this group has begun to reshape the structure of

social relationships for those most involved in market activities.

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University of Wisconsin - River Falls, with Dr. Casie Bass
Animal Science

Estrone Sulfate: Is it related to fetal sex?

It is currently unknown if there is a relationship between the amount of equine pregnancy hormone, estrone sulfate, produced and the sex of the mare's, a female horse, fetus. It is predicted that the sex of the fetus and the amount of the hormone present in the blood will correlate where males have a higher concentration of estrone sulfate over females. In this research the sex of each mare's fetus will be determined by transrectal ultrasound, followed by a collection of a blood sample from each mare. Six quarter horse mares ages 7, 7, 7, 10, 11, 17 from the University of Wisconsin—River Falls Lab Farm 1 in River Falls, Wisconsin were used in this study. It was determined that three of the six mares used in the study are carrying colts and 3 of the six mares used are carrying fillies. After receiving the samples back from the lab, it was determined that there was not a correlation between the amount of estrone sulfate produced by the mare and the sex of the fetus she is carrying. All results will be confirmed after each mare gives birth during the spring of 2021.

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University of New Hampshire
Mechanical Engineering

Modeling the Lateral Mixing of Aerosols

The goal of this project is to prevent lateral mixing of airflow between stationary individuals throughout enclosed settings in the University of New Hampshire. The methods for preventing lateral mixing of the airflow include but are not limited to: identifying the mixing before it reaches filtration, optimizing airflow patterns, and creating curtain-like structures. Computational Fluid Dynamics software, ANSYS-Fluent, will be used to model the airflow of the enclosed spaces and determine where passive barriers will be located for the most efficiency. The airflow from the heating, ventilation, and air conditioning (HVAC) system will be a strong indicator of how the air patterns should be optimized, as it will pick up droplets from individuals on its current and proliferate the particles throughout the room if the cross patterns are not modified.

Sophia Lopez, sophia_lopez2@baylor.edu
Baylor University, with Dr. Bessie Kebaara
Biology

Review of Nonsense-mediated mRNA Decay Pathway, Metal Homeostasis and Detoxification

Gene expression must maintain a high level of fidelity because proper gene expression is essential for all living cells and organisms in order to ensure cell function and viability. Nonsense-mediated mRNA decay (NMD) is a high conserved eukaryotic pathway, that functions as a quality control

process and regulates gene expression. NMD has been demonstrated to play a role in metal homeostatic mechanisms, including copper and iron homeostasis. Copper and iron are essential in biology because these metal ions are important catalytic cofactors in the redox chemistry that proteins need in order to carry out fundamental biological functions that are required for cell growth and development. While these metal ions are essential to proper cellular function, they are also toxic in excess amounts. Excess iron or copper can generate reactive oxygen species that degrade DNA, proteins, and lipids. Therefore, metal ion uptake systems of cells are tightly controlled and regulated. NMD can influence the phenotypes of human disorders because NMD is capable of making the genetic manifestation worse or better depending on the disease. Targeting the NMD pathway has also shown as a treatment for genetic disorders.

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Neuroscience

A Historical Analysis of the Searchable NeuroNex Database of Bioluminescent Molecules Designed Toward the Expansion of an Open-Access Bioluminescent Toolbox

As bioluminescence becomes more and more significant to imaging and manipulating neurons in neuroscience, there presents a need for a search tool that can concisely present bioluminescent molecules in a simplified construct for researchers to access freely. The NeuroNex Bioluminescence Database lists bioluminescent molecules and their properties that were discovered and utilized by prior researchers with specifics upon its compatible substrates, peak emission spectra, endogenous organism, size, signal, and more. Under the implications of this toolbox, neuroscientists and researchers may be better equipped to apply specific and appropriate bioluminescent molecules quicker and more efficiently to their individual research projects as well as the advancement of scientific knowledge. A historical analysis of the database was conducted after obtaining nearly one hundred different bioluminescent molecules from prior publications. Due to the lack of technology and other unknown factors, earlier works lacked the specification of bioluminescent molecules regarding their properties. Whereas recent works were more elaborate. This may suggest that the first luciferases discovered may be the ones we know the least about. A future direction for scientists today is to use advanced technology to re-approach earlier works and elaborate on their properties to expand the field of bioluminescence.

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University of Colorado Boulder, with Dr. Stefanie Johnson
Business & Sociology

Levers of Change at the Nexus of Business and Society in Relation to Sustainability

We are far from where society needs to be in relation to sustainability; therefore, it is necessary to understand the extent of change needed to achieve targets such as the UN's Sustainable Development Goals. Business activities, when leveraged impactfully, are a pervasive force that can drive sustainability efforts forward. The goal of this project is to identify key levers of change that

businesses can pull to move society towards sustainability. This annotated bibliography begins with a) mapping the current business & sustainability landscape and b) exploration of the role that corporate collective action plays in shifting cultural systems. Next, utilizing a framework built upon in the first focus, high leverage business opportunities were explored in the areas of Governance, Business Model, Supply Chain, Operations, Employees, and Citizens. These high leverage business opportunities are placed within a matrix that plots its potential for change (our proxy for leverage) against its timeliness (proactive/reactive). Finally, the conclusion ties together key levers of change: policies, operations & supply chain impact, stakeholder engagement, and disclosure & reporting. Now that we have identified key levers of change, they can be adopted by businesses, allowing for our research to extend from theory into praxis. Ultimately, this impact is twofold: first, it provides a diverse roadmap for ambitious business leaders to grasp onto and build upon; additionally, this work will hopefully inspire business action that will go on to act as a positive feedback loop that feeds more examples and nuance to our ever-evolving roadmap to sustainability.

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University of Wisconsin - River Falls, with Dr. Cyndi Kernahan
Psychology-Mental Health

Race, Stigma and Asking for Help

There are many types of stigma, some examples being public stigma and self-stigma. Public stigma can be defined as “referring to when the general population endorses stereotypes and discriminates against people labeled mentally ill” and the definition of self-stigma is “when a person with mental illness internalizes the prejudice they experience” (Eghaneyan & Murphy, 2019). Several studies have found that stigma has a great impact to one’s decision to seek help, which could be detrimental to someone’s health. This research explores how much these stigmas differ between racial communities and how that impacts an individual’s decision to seek professional help for mental health issues. For this study, a survey was developed based on different scales that measure stigma and experience with mental illnesses. The scales were derived from the work of researchers Holmes and Vogel, which was designed to collect data regarding individuals’ attitudes and behaviors on mental health and mental health assistance. In addition, the survey included questions about basic demographics and participants’ history of seeking mental health assistance. The hypothesis was that the White community would report less stigma than any of the other communities studied, additionally we anticipated that the more stigma would correlate with less likelihood of seeking help. We collected 32 viable surveys and our results indicated that there is no significant difference between the racial communities investigated. Surveys are still being collected to be able to find any significant findings between each racial group. It was through the help of the Ronald E McNair program that the University of Wisconsin-River Falls has that helped me throughout my research, as well as my mentor, Cyndi Kernahan.

Josie Marquez, joma3996@colorado.edu
University of Colorado Boulder, with Dr. Alexis Templeton
Geology

Exploring Lipid Biomarker Profiles of Sulfate Reducing Bacteria in Low-Temperature Serpentinizing Systems Utilizing Batch Cultures

This project seeks to explore how the lipid profiles of sulfate reducing bacteria (SRB) vary with growth conditions that simulate those of the oligotrophic, deep groundwaters in the Samail Ophiolite in Oman. SRBs are abundant in this setting: I want to identify lipid biomarkers they produce and how they change their lipid composition in response to nutrient and energy limitations. Batch culturing – media composition, carbon sources, nutrients and pH are varied – is my guiding principle. I am growing well characterized strains of Thermodesulfovibrio sp. which are genetically similar to SRBs in the Omani subsurface. I am also culturing these novel Oman SRBs using media that mimics subsurface fluids. Once enough biomass is grown from the cultures, I will perform a lipid extraction and use HPLC-MS to characterize their lipids. Understanding how the lipids vary across growth conditions could identify the source of unusual lipids in the modern system, and to effectively use lipid biomarkers to interpret past geochemical conditions.

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Psychology

Foster Parents' Experience: An Analysis of Secondary Trauma, Burnout, and Available Resources for Foster Parents

Children in the foster care system often experience multiple traumas in their lifetime. When they move in with their foster parents, they are bringing these traumatic experiences with them into the home; and this can result in secondary trauma for the foster parents. The purpose of this research is to provide an analysis of literature that examines the lives of and resources available to foster parents to provide a deeper understanding for why they may be more susceptible to secondary trauma. This study also analyzes current resources available to foster parents to be able to recommend ways to improve them to accommodate for secondary trauma. The intention of the study is to increase support for foster parents that will be appropriate to their experience.

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Chemistry

The Synthesis of Structural Molecular Models of the Active Site of Aberrant Copper Zinc Superoxide Dismutase (SOD1): Evaluating How Structural Deformations Lead to Disease

Amyotrophic lateral sclerosis (ALS) is a disease that leads to the death of neurons controlling voluntary muscles. Its origin is linked to the oligomerization of aberrant CuZn superoxide dismutase

(SOD1). SOD1 scavenges for superoxide. Superoxide is a form of oxygen that possesses an extra electron. It is highly reactive and leads to the damage of cells. Certain alterations of SOD1 have an influence on the development of ALS in several ways. Fluctuations within the electrostatic loop (ESL) of SOD1 allow for the formation of aberrant oligomers. The restriction of the ESL leads to a loss of mobility that impacts the active site of SOD1. This then leads to aberrant behavior. Aberrant behavior of the active site leads to overoxidation and results in the loss of copper. This promotes aggregation and transmits disease. In order to understand how geometrical deformations impact disease, a literature survey on N4 Cu(II) complexes has been conducted to determine how the nature of ligands impacts the geometry of complexes. Two novel ligand structures will be proposed. They will be used to synthesize model complexes of the active site of SOD1. These model complexes will be used to analyze how aberrant behavior is linked to geometric deformations.

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Higher Education

The Effectiveness of Pre-college Programs

A pre-college program is an early intervention program for middle and high school students to learn about college. The primary focus of each program varies across institutions, though pre-college programs primarily aim to encourage students to enroll into college. Many of these programs target underrepresented students in order to increase their participation in higher education. Although pre-college programs intend to increase college access, the impact of pre-college programs remain unclear. To understand the impact of pre-college programs among participants, this literature review gathers knowledge about student outcomes among programs that currently exist, focusing on college aspirations, academic outcomes, enrollment rates, and retention rates. Current knowledge indicates a positive impact coming from pre-college program participation. Still, this review will identify areas in need of further research and to provide recommendations for pre-college programs in the future.

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Psychology

Exposure to Immediate Rewards Increases Impulsive Choice in Humans

Previous research suggests that consistent preference for smaller, sooner rewards over larger, later rewards is associated with a host of maladaptive health-related behaviors. Non-human and human studies have shown that chronic exposure to immediate rewards increases the consistent preference for smaller, sooner rewards. For all experiments, human participants were exposed to acute delay exposure via a series of surveys based on assigned conditions: delay exposure, immediate exposure, or standard control. In Experiment 1, participants had points as their reinforcers after completing the delayed discounting task. In Experiment 2, participants had a fixed amount of monetary value as their reinforcers. Lastly, both experiments were grouped together in

order to analyze any differences in discounting values between different reinforcers. Our results indicate that participants in the immediate exposure group in Experiment 1 discounted more than participants in the delayed exposure and standard control groups. In Experiment 2, male participants in the immediate exposure group discounted more than the female participants of the same group. When the data is combined, we see that regardless if points or money, those in the immediate exposure group discount more steeply than the participants in the other two conditions. The key component of these results suggests that immediate exposure increases preferences of smaller, sooner rewards and suggests further research should be made on interventions that decrease this behavior.

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Computer Science

Stumbling into Virtual Worlds. How Resolution Affects Users' Immersion in Virtual Reality and Implications for Virtual Reality in Therapeutic Applications.

This study will evaluate if rendering resolution affects users' sense of immersion in Virtual Reality (VR). VR research did not mention or did not consider "gaming technicalities," i.e. rendering resolution and rendering frame rate, in their previous studies. If these gaming technicalities can affect a user casually using VR, would it not also affect a user in other applications of VR (e.g. simulators, treatments for psychological and mental disorders, ways to explore the architecture of new and nonexistent structures, and ways to better understand the human body in medical applications)? The current exploratory study will use two comparison groups. Treatment levels will be (a) low and (b) high rendering resolution. Response variables are two measures of participant's immersion: (a) participant's sense of presence and (b) participant's sense of embodiment. One potential moderating variable, game type, will be varied over three levels. Participants will be split into two groups to account for previous VR experience but no participants nor the research observer will know the treatment level. The measurements are collected from a questionnaire after each game. For each dependent measure, sample descriptive statistics—mean (M), standard deviation (SD), median (Q2), and inter-quartile range (IQR) with a conventional significance level of 0.05 will be evaluated. Results of this study will guide conclusions related to resolution's effect on users' sense of immersion in VR.

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Biology

Determining Programmed Translational Frameshifts in Bacteriophages

Programmed translational frameshifting is a rare and naturally occurring event that allows for the production of two peptide products from one mRNA transcript. This translational event is prevalent and has been well-studied in the tail assembly chaperone (TAC) genes of bacteriophages. Translational frameshifts have a repetitive stretch of nucleotides called a "slippery sequence" which typically follows a 5'-XXXYYYX-3' structure. The slippery sequence of the TAC gene is well

documented as 5'-GGGAAAG-3' and thus is used to identify the location of translational frameshifts in the TAC genes of phage genomes. BryanRecycles, a Streptomyces griseus bacteriophage, has a known frameshift in its TAC gene and a potential frameshift in its DNA primase gene. Similar to that of the well-studied frameshift in TAC, there is a significant amount of coding potential in a -1 open reading frame (ORF) that starts before the stop codon of the genes. Using the TAC gene as a positive control, our goal is to develop and test for a set of procedures that will confirm the presence of a ribosomal frameshift. First, we isolated the target phage DNA through the use of primers and amplified the DNA by performing PCR. We then inserted the DNA into the plasmid vector pUC18 and transformed colonies of DH5_ E. coli. Next, we isolated and purified the peptide products via column chromatography. Finally, the proteins were analyzed via SDS-PAGE and western blot. Moving forward, we will perform an immunoassay and sequence the proteins to ultimately confirm the presence of translational frameshifts.

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Biology

Assessing the Localization of DAF-16 in C. Elegans Unc-33 Mutants

The most common form of dementia is Alzheimer's, which has no known cure. Recent studies have indicated collapsin response mediator protein-2 (CRMP-2) as a potential drug target in humans. Caenorhabditis elegans (C. elegans) ortholog is UNC-33. Under stressed conditions, C. elegans arrest to a dauer life stage, known to increase longevity. A principal regulator of dauer formation is the DAF-16 protein. Under a traditional lifecycle with non-stressed conditions, the DAF-2 pathway is activated, downregulating the phosphorylation and localization of DAF-16 in the cytoplasm. Under stressed conditions, DAF-16 translocates from the cytoplasm to the nucleus. Unc-33 C. elegans cannot form dauers. The localization of DAF-16 in unc-33 mutants is unknown. We believe that DAF-16 is mislocalized in unc-33 mutant C. elegans when undergoing stressed conditions. To better understand the mechanisms that control dauer development and longevity, this study will investigate the location of DAF-16 in unc-33 mutants. This experiment uses three DAF-16 isomers, DAF-16a, DAF-16b, and DAF-16d/f, fused with GFP to reveal the localization of DAF-16 when unc-33 mutants are stressed. Isolation and imaging are used with fluorescent microscopy and confocal imaging to discover where the DAF-16 is localized. We hypothesize that the DAF-16 protein will not localize into the nucleus when unc-33 mutants undergo stressed conditions, leading to the inability to produce dauers. The localization of DAF-16 in unc-33 mutants in the cytosol could indicate why unc-33 mutant C. elegans are unable to arrest dauers and will give researchers a better understanding of the mechanisms behind the CRMP-2 human protein.

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Chemistry

Molecular Docking Study of ITPA Protein Substrate Complex

ITPA is an enzyme that is responsible for maintaining a proper level of nonstandard nucleotides

in cells. The enzyme is associated with adverse drug reactions for thiopurine or ribavirin therapy. The prediction of drug interactions sites in ITPA protein is important for modulating ITPA-related drug toxicity. There are a vast number of tools available to predict molecular interactions between receptors and ligands. The methods utilized in this study include computational docking to explore bound conformation and energy in the binding of ITP to ITPA protein. The docking results reveal how well ITPA and ITP bind together in comparison to the native complex. The root-mean-square-deviation, rmsd, is computed to analyze the similarity of the docked structures as well as the binding free energies and ligand efficiencies to rank the structures. The significance of this research study is to understand the mechanism of ITPA binding. The importance of this research pertains to visualizing operative configurations of a protein-ligand complex that will cleanse nucleotide pools and repair damaged DNA.

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Psychology

Assessing Compassion Fatigue Amongst Social Workers in the Child Welfare System

Child welfare research has historically placed little emphasis on the social workers who are on the frontlines in their work with children and families. Compassion Fatigue is a concept that refers to the emotional and physical exhaustion that can affect helping professionals and caregivers over time. This study aims to utilize a mixed method approach to explore the factors that contribute to compassion fatigue, as well as its effects on social workers in the child welfare system. Social workers will be assessed using the Compassion Fatigue Self-Test for Psychotherapists to examine the causes and symptoms of compassion fatigue amongst child welfare social workers. In addition, this study will utilize qualitative interviews with a few key stakeholders who will be selected using an availability sample process.

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Epidemiology and Biostatistics

Examining the Impact of a Father's Childhood Experiences on the Relationship He Has with the Mother of His Baby

It is unknown what influence the childhood experiences of a father have on the relationship he has with the mother of his baby. Fathers were recruited through a study of Black pregnant women and risk of preterm, birth Fathers completed questionnaires to measure ACES, their relationship with the mother of his baby, and sociodemographic characteristics. The adverse childhood experiences of fathers were measured using a ten item scale assessing if they occurred or not (i.e. ACES). His relationship with the mother of his baby was measured with a conflict scale of five items using five-point Likert responses. The purpose of the study was to examine how the adverse childhood experiences (measured by a ten item ACES scale) for fathers may affect conflict in his (current) prenatal relationship with his child's mother. We used a t-test to compare the average score on the

conflict scale for fathers with two or fewer ACES compared to those with three or more ACES. We hypothesized that fathers with fewer ACES would have a higher score on the conflict scale (more conflict). The major findings of the study show a higher ACES score of the father was associated with higher conflict with the mother of the baby.

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Physics

Reducing Data for the Arecibo Pisces-Perseus Supercluster Survey

The universe is vast, yet only five percent of it consists of tangible matter. A large portion of the universe is made of dark matter and its structure is governed by the distribution of it, yet there is uncertainty as to what this entity is. For this research, thirteen galaxies and their velocities, flux, and Hubble distances are presented. Thirty-seven sets of observation data were reduced utilizing a package of functions written in Interactive Data Language (IDL) specifically for the measurement of a galaxy's neutral-hydrogen profile. Observations were conducted at Arecibo Observatory with the L-band Wide receiver, which determines the intensity of a received emission, and the Wide-band Arecibo Pulsar Processor, which separates the emission into the component frequencies. This project is in collaboration with the Arecibo Pisces-Perseus Supercluster Survey. The goal is to contribute the determined information about the detected galaxies to the survey, which aims to use galaxies to probe the dark matter distribution of and gain a deeper understanding of the large-scale structure of the supercluster.

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English - Creative Writing

Obtaining the Eye for Cinematic Storytelling

Fundamentally, a screenplay and film are simply different avenues to tell a story: while a screenplay tells the story with words, a film tells the story with pictures. As a developing screenwriter with no experience in film production, my objective was to obtain the eye for cinematic storytelling by examining and experiencing first-hand the pre-production, production, and post-production processes of creating a film. By doing so, I hoped to gain a better understanding of how to transition a story from script to film, or words to pictures. With the enhanced understanding of the overall filming process, one's ability to write a screenplay will undoubtedly improve because they will be better equipped at writing a story told with words that could potentially be more easily transitioned into a story told with pictures, which is essential within the professional industry. This project consisted of two phases. I first researched, analyzed, and surveyed multiple filming techniques that professional filmmakers use in the industry by conducting a comprehensive literature and film review. Then, I assumed multiple filmmaking roles to produce an original short film and implemented many of the techniques during the process. However, this presentation only presents the analysis, results, and discussions of the pre-production process due to the

Covid-19 pandemic restricting resources and overall ability to film safely. The analysis, results, and discussions of the production and post-production processes will be added to this creative research project when the ability to continue with the production of the film arises.

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Clinical Psychology

The role of APOE Îµ4 in Executive Function, Verbal Memory, and Attention in Participants With and Without Mild Alzheimer's Disease

The apolipoprotein E (APOE) gene is a well-established risk factor for late-onset AD. APOE has 3 alleles, or types, known as _2, _3, and _4 alleles. While _3 carriers of the APOE gene are the most common, APOE _2 carriers have reduced risk of developing AD compared to _3, while _4 carriers have increased risk compared to _3 carriers (Mayo Clinic Staff, 2019). The APOE _4 genotype has been shown to have a relationship with executive function, verbal memory, and attention (Luck et al, 2015, Hunter et al, 2020, Reverte et al, 2015), which are three types of cognitive performance that are commonly tested. However, the effects the APOE _4 genotype has on cognitively unimpaired participants versus those with mild AD has not been fully explored. The objective of this study was to determine whether APOE _4 genotype has differing effects on executive function, verbal memory, and attention in older adult participants with and without AD, after adjusting for sex, education, and age. Our results showed that APOE _4 carrier status is significantly associated with cognitive performance in cognitively normal participants, but not in those with mild AD. These findings suggest that the majority of the cognitive performance in people with AD can be explained by the disease, while cognitive performance in people without AD is explained by other variables.

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Molecular and Cell Biology

Sequential microbial fuel cell-vermifiler system for treatment of winery wastewater

With increasing demands on freshwater resources, we must find alternate means to recycle wastewater. On average, wineries generate six liters of wastewater for every one liter of wine produced. Due to space limitations that obviate the use of energy-intensive aeration ponds, many wineries are faced with the burden and expense of wastewater transportation to off-site facilities. In collaboration with the Okinawa Institute of Science and Technology, we constructed a small-footprint system consisting of a microbial fuel cell (MFC) and earthworm-containing vermifilter placed in series, for treating winery wastewater at Vintners Square, Santa Rosa, CA. Water at various steps in the treatment process was assayed for total organics, phenolic compounds, and suitability for use in irrigation of various greenhouse-cultivated plants. We found that the MFC removed the majority of the total organics while the colored phenolic compounds were largely removed by the vermifilter. Removal of phenolics by the vermifilter corresponded to complete

or partial removal of the plant growth-inhibitory activity of the water for lettuce and sage plants, respectively. The embodied energy in the wastewater organics was converted by microbes in the MFC primarily into methane with the generation of a small electric current. The success of the vermifilter at removing phenolics may owe to the known ability of earthworms to enhance levels of phenolic-degrading bacteria in their environment along with production of phenolics-degrading enzymes by the earthworms themselves. We are currently testing a newly designed distributor that allows for percolation of wastewater across a wider vermifilter bed surface area.

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English

Undocumenting Superman

In September 2017, the Trump administration made the shocking decision to rescind DACA, the Deferred Action for Childhood Arrivals program that offered temporary relief from deportation to eligible immigrant youth who came to the United States as children. That same week, Action Comics No. 987 published a scene in which Superman faces off with a disgruntled ex-employee and white supremacist who intends to kill the undocumented workers. In this paper, I explore how in our contemporary political moment, this cultural icon has become an increasingly polarizing figure. Superman and his alter-ego, Clark Kent, are conventionally imagined as symbols of American heroism and traditional American values. However, what scholars, fans, and readers often overlook is that our caped crusader is undocumented. He is literally an "illegal alien," brought to Earth as a baby and adopted by an American couple. And even though Superman could qualify for DACA, he is not profiled or read that way, because he assimilates well into the dominant culture. By looking at Superman, I intend to reimagine what it means to be a reader and fan of Superman and to deconstruct what it means to be an undocumented immigrant. Through the close reading of Superman comic panels and everyday pop culture relevancy, I highlight how both the Man of Steel and the Mexican undocumented community in the U.S. embody heroism, the latter also deconstructing the negative stereotypes placed on them by the very medium that hides behind and celebrates the acceptable performance of an undocumented, "illegal alien."

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Psychology

Evaluating the Effectiveness of Faith-Oriented Psychotherapies: A Mixed Methods Review

Incorporating religion and spirituality into psychotherapy has been a controversial development. Nevertheless, a number of studies found evidence suggesting that when compared to conventional psychotherapy, faith-oriented psychotherapy results in better treatment outcomes for R/S individuals with anxiety and depression. I systematically reviewed the research literature on faith-oriented psychotherapies in order to investigate their effectiveness in R/S participants with anxiety and depression. Databases searched included: PsychINFO, Google Scholar, PubMed,

and ProQuest. Inclusion and exclusion criteria were applied in literature search, with both quantitative and qualitative studies included. In total, 11 articles were considered eligible for the review. While review of the studies suggested that when compared to conventional therapy, faith-oriented psychotherapies resulted in lower post treatment levels of depression and anxiety, lack of consensus in treatment approach rendered uncertain the reasons why. Using a mixed-methods approach, factors suspected to have moderated treatment effects were identified and evaluated. Proposals for an effective treatment design were illustrated through review of a case study. Implications for faith-oriented psychotherapies and conducting research in this field moving forward were propounded.

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Forensic Psychology

Understanding Mental Health Motives in Individuals Charged with Driving Under the Influence

Driving under the influence of numerous drugs is illegal in all 50 states; however, driving under the influence of alcohol is legal at a certain level yet 10,511 people died in 2018 from alcohol-related crashes (NHTSA, 2019). This number only captures those affected by crashes induced by alcohol; it does not include narcotics, marijuana, and other mind-altering substances. When multiple drugs are present within the body it can intensify the effects of all drugs consumed. The proposed study will contribute to reducing the number of deaths associated with driving under the influence by better understanding how drugs can affect decision-making and criminal motivation. Through this study I hypothesize that stimulant drugs such as cocaine or amphetamine will affect decision-making and increase the desire to commit crimes such as driving under the influence. I propose to speak firsthand with individuals charged with driving under the influence in order to understand the criminal motives behind certain drugs and how these drugs can claim responsibility for more crimes than just DUIs. My goal is to determine if different drugs can drive a person to intentionally commit these crimes and how each of their motives may had differed. Due to the lack of research within the field of drugged driving, this study would help to fill in the gaps within this area as well as expand upon previous alcohol-related research. While the proposed research cannot stop all individuals from committing these crimes, it can help bring light to why this occurs and who may be more inclined to receive treatment.

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Mathematics

Using Numerical Methods to Solve the 1-D Heat Equation in Python

In this paper, we seek to analyze the stability of different implicit and explicit numerical methods to solve the 1-D heat equation. Using Python, we can compare the results from each method to find which is the most accurate with the least time steps. Additionally, we restructure each method to separate the spatial and temporal discretization. Which allows for us to use object-oriented programming. We will also implement Linear Algebra reworks of our three explicit methods even

though it does change accuracy. In our conclusion, we find that the Midpoint method is the most accurate explicit method and Crank-Nicolson is the most accurate implicit method. Be-tween the two the most efficient method is Crank-Nicolson. However, since this project does not work with immensely large matrices, we do not effectively see the difference in time-efficiency. It is worth noting that Crank-Nicolson will be more accurate while also running quadratically less timesteps. Furthermore, we will use these results to explore possible applications such as using different boundary conditions and solving the wave and convection-diffusion equations.

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Education

Reviewing the Lived Experiences and Identity Intersectionality of Females on the Autism Spectrum

This review synthesizes the current research pertaining to intersectionality and autism, focusing on the lived experiences of females on the autism spectrum. Many of the studies conducted have highlighted the lived experiences of autistic women and adolescent girls through a collection of open-ended, semi-structured interviews. Designs and frameworks included narrative inquiry and interpretative phenomenological analysis, and theories such as emancipatory theory, disability critical race theory, and personal construct theory. Results displayed themes concerning the conceptualization of gender identity, connection to autism identity, social camouflaging of autistic behaviors, impact of late-diagnosis, and comparisons of pre- and post-diagnosis experiences. Most studies did not include whether perception of racial/ethnic identity was significant in participant experiences. Important outcomes were that experiences varied by perceived effectiveness of social camouflage, challenges to receiving diagnosis, factors contributing to mental health and well-being, and the significance of special interests in identity development. The implications of this review are increased holistic understanding of intersectionality on identity formation and the barriers to diagnosis, access to services, and inclusion.

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Kinesiology

The Extent Helmet Types Have on Helmet Motion

Since its inception in the early 1900s, American football has been a high-contact sport associated with head injuries, such as concussions and even Chronic Traumatic Encephalopathy (CTE). These injuries ensure helmets are considered an essential part of equipment. Despite tremendous developments in helmet design and technology, concussions and CTE continue to be a threat for football players. This study uses three-dimensional kinematic motion software and the sensors that work with it to conduct linear drop tests from four different heights (5 ft, 6.5 ft, 8.5 ft, and 10 ft) comparing two different football helmet types (Vicis and Riddell). To determine helmet motion and calculate the findings for each trial, we will use the weight of a dummy head form (5.16 kg) to represent the weight of a head. The study was conducted with three trials at each height for

each helmet type. Our focus will be on peak force, peak instantaneous loading, and peak linear accelerations for each helmet type. Due to the differences in helmet design and technology, we anticipate the Vicis helmet will be better at reducing helmet motion. While further research will be required to determine the impact rotational acceleration has on helmet motion, this study represents an important step, one that could advance helmet design, inform purchasing decisions across the industry, and ultimately reduce the number and severity of concussions among football players.

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Psychology

Encoding and Test Interaction in the DRM Paradigm

A recent study by Ulatowska et al. (2020) showed that using a 2FC test resulted in fewer semantic memory errors as compared to a traditional yes/no test in the DRM paradigm (Deese, 1959; Roediger & McDermott, 1995). The researchers attributed this difference to a possible enhanced source monitoring at the time of retrieval while performing a 2FC test. In this study, participants were instructed to memorize semantically related words either at a shallow or deep level and later to perform a 2FC or yes/no test. The results confirmed previous findings that the 2FC test resulted in fewer semantic errors, however, only following deep encoding. Shallow encoding resulted in a comparable rate of semantic errors. The memory rate for studied items was higher when the 2FC test was applied following both types of encoding. The results will be discussed in the framework of source monitoring as well as familiarity and recollection.

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Psychology, Sociology

Considering the Immigrant Civic Potential: Latinx Immigrant-origin Youths' Civic Identity Development Prior to the 2020 Election

During the 2016 presidential election, negative attitudes toward immigrants intensified and are still prevalent now as the 2020 election approaches. As a result, the current discussions of immigration are largely polarized, and the impact on Latinx immigrant-origin youths remains unclear. To better understand this matter, the present study particularly concerns the combination of civic engagement, sense of belonging, and internalization of polarized political discourse in relation to the upcoming election. Negative political discourse may incite engagement through defiance or indignation, or conversely, inactivity because of perceived rejection or hopelessness. Moreover, it is possible that negative political discourse may impact individuals' sense of belonging regardless of the extent of their engagement. Through a qualitative approach, interviews of Latinx individuals of immigrant origin will provide insight about the roles and influences behind their civic identities and their perceptions, reactions, and sense of belonging in the US. The results appear to lean toward increasing engagement, with some young adults striving to defend their heritage and prioritizing

national-level voting. Most participants also reported feeling overwhelmed, fearful, and angry. These findings appear to communicate immigrants' challenges and processes of civic identity development as they navigate and participate within their surroundings, prompting for ways to serve, comfort, and encourage their involvement and wellbeing.

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Philosophy

Power, Death, and Freedom An Investigation into How Social Identity Affects our Perception of Self and Our Existential Experience

Power, death, and freedom are what I take as the 3 themes at the core of freewill, and thus, the core of existentialism. In this project, I discuss the push and pull of language and identity as related to these three themes, and how Nietzsche's Will to Power holds an important message on the creation of self and creation of power worthy of being retailored for the modern era if we are diligent in addressing how meaning/language dictates its reception. I endeavored to display how in moments the "traditional philosophy" of continental thinker Friedrich Nietzsche was complementary to contemporary ideas on the self as posed through decolonial frameworks. This project also seeks to complicate the more academic/"intellectual" understandings of topics such as existentialism by engaging with non-philosophers via survey work to investigate the critical internal/intercommunal conversations people have outside of academic institutions. How we exist in the world cannot only be explained by "the higher men" in tenure track positions; we must be critical of why what we say about ourselves and what others say about ourselves is a product of what is external to us while simultaneously willing ourselves to derive names for ourselves (power for ourselves) from within.

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History

George W. Bush: The Rise of Evangelical Rhetoric and a Modern-Day Christianity's Complacency

The purpose of this study was to discover the impact that the Faith-Based and Community Initiative set forth by President George W. Bush, during his presidency, had on the modern, evangelical church and how it impacts the current state of affairs and the line between church and state under President Donald Trump. Through this research it can be shown that the use of evangelical rhetoric by President George W. Bush, his executive orders and Faith-Based and Community Initiative, that the line between church and state began to be breached, leading to an agreement and perceived unity between the United States government and the evangelical Christian church. Using research drawn from the White House Archives, the George W. Bush Presidential Archives, correspondence, speeches and interviews, this research draws a line from evangelical support for George W. Bush to Donald Trump, and the repercussions that have come from a blind following of "God's chosen" leaders.

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Sociology

STIs and Stigma: Effects of STI Diagnoses and Sexual Identity on Perceptions of Potential Partners

Much research on sexual health focuses on prevention of sexually transmitted infections (STIs). While this focus on prevention is essential, less research has addressed how people who already have an existing STI diagnosis can engage in healthy and satisfying sexual relationships. The current study examines to what extent potential partners are stigmatized for an STI diagnosis and whether prevalence of this stigma varies based on sexual identity. Participants (n= 189) were presented with a vignette describing a potential romantic/sexual partner named Jamie. Participants were randomly assigned to one of 5 conditions, which varied in how Jamie's STI status was described. Results find that participants judged Jamie's personal characteristics (e.g., responsibility, integrity) more harshly if Jamie was never tested for STIs than in any other condition, but that participants were similarly unlikely to want to have sex or a relationship with Jamie in the HSV, HIV, and never tested conditions, deeming Jamie's STI status as 'just as bad' as never being tested. Thus, individuals who are currently receiving treatment for HIV or HSV are perceived to be less desirable as romantic or sexual partners. This suggests a need for public health interventions to decrease stigmatization of individuals with incurable STIs.

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Evolutionary Biology and Pathology

Characterization of BAF Subunit Expression Across Human Tissues Reveal Tissue- and Cancer-Specific Complexes

The mammalian BAF ATP-dependent chromatin remodeling complex controls the mechanics of gene expression through fifteen protein subunits. These complexes are abundant across all human cells and can theoretically be assembled into hundreds of combinations from the products of twenty nine genes. However, little is known about BAF subunit organization and its influence within healthy tissue and cancer development. The BAF complex is frequently mutated in neurodevelopmental disorders and cancer. The goal of this study was to characterize BAF subunit combinations in healthy and cancerous human tissues to identify complex arrangements special to tumor formation. A meta-analysis of transcriptome BAF subunit data was conducted via R and Python. Expression data for polybromo (PBAF), noncanonical (GBAF), and canonical BAF subunits were sourced to generate a list of complex combinations for healthy and cancer samples. Preliminary data show a unique combination of ACTL6B, SMARCA4, and ACTA1 subunits within a subset of cancer types. These subunits were modeled using Pymol software to clarify proteomic structure and potential drug targeting regions for cancer specific treatment. Elucidation of BAF subunit combinations in healthy and cancerous tissues has clinical applications for treating tumors. Current pharmaceuticals that target the BAF complex do not ensure specificity and mistakenly poison healthy complexes. These data provide the first step toward more precise therapeutic approaches.

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University of Wisconsin - Oshkosh, with Dr. Aggie Hanni
Psychology

Academic Outcomes of Students with ASD at UWO

Recently, more students with autism spectrum disorder (ASD) and other disabilities are beginning to continue their education beyond high school. Much research has been done on children with ASD, but there remains a gap in research on adults and adult services for those with ASD. Most postsecondary education institutions provide services to those with disabilities, but not all disabilities require the same services. This study aims to evaluate the efficacy of services for those with ASD at the University of Wisconsin Oshkosh (UWO) as they relate to student's academic outcomes. De-identified data was gathered from UWO's Accessibility Center of 20 students with ASD from Fall of 2014 – Spring of 2020. Quantitative analyses revealed lack of support for the hypotheses under investigation; however, it was determined that transfer status was significantly correlated with higher graduation rate ($r=0.65$, $p<0.05$**). Future studies should aim to further examine the possible role of attending more than one institution to degree progression of students with ASD.

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University of Wisconsin - River Falls, with Dr. Brian Greco
Animal Science

Access to an animal activated feeder: effective in reducing anticipatory behaviors in laboratory rats?

Anticipatory behaviors typically reflect an animal's inability to control access to desirable resources or boredom with their environment and can become a main concern with animals in managed care. They can be precursors to stereotypic behaviors, which are repetitive movements with no apparent function that stem from repeated attempts to cope, frustration, or central nervous system dysfunction. Stereotypic behaviors are known to help animals reduce arousal and can be associated with reduced hypothalamic-pituitary-adrenal axis response to stress. Animals in managed care often lack the ability to autonomously control access to desired resources. When resources are provided they are typically provisioned by the care team without clear predictive signals which makes the managed environment vastly different from the animal's evolutionary niche. With the use of an Arduino UNO microcontroller, stepper motor, pushbutton, and a LED, we constructed an animal activated feeder to be implemented into three laboratory rats' environments. Our objective is to develop protocols for addressing anticipatory behavior using clear signals of resource availability, allowing the rats to control access to resources autonomously. We believe that integrating the animal activated feeder into the managed environment of the laboratory rats will help reduce anticipatory behaviors and stereotypic bar-chewing and redirect their focus towards their living environment. Our intent is to develop an easily customizable apparatus that may be used for different species and mass produced for installation in designed laboratory and zoo environments. Thank you to the Ronald E. McNair Program for allowing us to conduct this research during the summer.

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Bowie State University, with Dr. Eric Bonsu
Biology/Chemistry

A Facile Glycosylation Reaction Leading to Total Synthesis of Toyocamycin

During the spring 2020 semester, myself and a small group of other students from Bowie State University, came together to conduct research on a potent anti-cancer drug known as toyocamycin. Toyocamycin is a nucleoside - type antibiotic analogue of adenosine, isolated from Streptomyces species. It is an antitumor antibiotic with various target activities and a potent inhibitor of RNA self-cleavage in mammalian cells. There are a few ways to synthesize Toyocamycin but our method used was based on modifications to the sugar and base. Our hypothesis is that this would be the most efficient method to synthesize Toyocamycin. The overall goal of this project is to develop a simple method to synthesize the anti-cancer antibiotic toyocamycin. Unfortunately, due to the Covid 19 pandemic and quarantine, our research was cut significantly short leaving us with no other alternative but to speculate.

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Psychology

Attitudes Toward Bisexual Women: A Comparison of Lesbian and Heterosexual Women

With the use of a survey constructed with Biphobia Scales-Female (Mulick & Wright, 2011), the 7-item Social Dominance Orientation scale was used (Ho et al. 2015), and an additional 37 question measure created by me, 250 participants were examined for their attitudes regarding bisexual women. With removing some participants due to failing attention checks or false information provided, there were a total of 111 lesbians and 115 heterosexual women. The goal of this study was to see if heterosexual women and homosexual women had any differences in what predicating factors lead to their potential biphobia. I predicted that 1) for lesbian women, negative experiences with individual bisexual woman, perceived uncertainty and perceived lack of allyship to LGBTQ issues from bisexual women will predict negative attitudes more strongly than in heterosexual women, and 2) for heterosexual women, perceived threat will be a stronger predictor of negative attitudes than in bisexual women. In both groups, I predicted that attitudes toward bisexual women will be more negative a) as social dominance orientation increases, and b) among participants with children. The results of the study were that there is no significant difference between lesbians and heterosexual women in their attitudes towards bisexual women. I did support the hypothesis that SDO would predict negative attitudes in both groups, and that participants with children would feel more negatively toward bisexual women. This latter finding requires further examination. Overall, this research was important for providing more evidence into the issue of biphobia and double discrimination.

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Computer Science

Weights and Gates: Automated Testing of Non-Functional Requirements

In higher education, students rely on feedback from professors to learn and improve from their work. Computer programs are amenable to automated tests, but automated tests almost exclusively verify the input/output behavior of programs, called functional requirements. However, the style of a student's code, how they get a certain result, is often more important than the result itself. Further, there are often requirements on the scalability of a program. Such criteria, more concerned with the characteristics of a program, and less with its output, are called non-functional requirements. Though the enforcement of non-functional requirements is a critical concern for educators, there is a dearth of effective tools for automated evaluation. We present Weights and Gates, a grading framework written in Haskell. With an expressive syntax for educators to automate grading, Weights and Gates provides a suite of tools for evaluation of both functional and non-functional behaviors of programs. In addition to automating much of the final evaluation of programming projects, Weights and Gates gives students ongoing, immediate, feedback as they progress on assignments.

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Lee University
Deaf Studies

The Effect of COVID-19 on d/Deaf and Hard of Hearing College Students

This project aimed to study the unique impact of COVID-19 on d/Deaf and hard of hearing (DHH) college students. The researcher hypothesized that DHH college students have limited access to COVID-19 related information in their first or preferred language. Past studies suggest that limited access to information has a detrimental impact on the mental health of DHH individuals. Such mental health concerns are exacerbated by the global pandemic we find ourselves in. In order to thoroughly study the effect of this unique time on DHH college students, this project consisted of three components: the review of literature, comparison of English and American Sign Language (ASL) news programming, and a survey of DHH and hearing college students. The study revealed that DHH college students have a more negative emotional response to the pandemic and less access to information in their first or preferred language. Additionally, mainstream news tends to be inaccessible to the DHH. Thus, DHH college students are relying heavily on social media and online news for their COVID-19 related information. In conclusion, DHH college students are at risk for misinformation and negative emotional responses due to language barriers. Special thanks are extended to Dr. La-Juan Bradford and the Lee University McNair Scholars Program.

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Neuroscience

Fiber Photometric Recordings of Rat Prelimbic Medial Prefrontal Cortex Activity in a Cocaine Conflict Model of Self Administration

Drug addiction is characterized by a compulsion to seek the drug, despite negative consequences associated with its use. These behaviors can be modeled in animal studies by introducing conflict-based designs wherein the drug is associated with mild, aversive shock, and thus reflects the human tendency to seek drugs despite negative conditions. Prior work shows that activity within the prelimbic sub-region of the medial prefrontal cortex (PrL-mPFC) correlates with cue driven drug-seeking. This experiment examined how population recordings of calcium-dependent neuronal activity in the PrL-mPFC may be influenced by drug associated cues under conditions of conflict and without conflict. Rats (N=12) were trained to self-administer cocaine by nosepoking in a port (1 mg/kg/inf; 6 hr/day for 14 days), during a chain schedule procedure where a lever press granted access to the nosepoke port. After stable performance on the chain schedule, the floor grid in front of the nosepoke port was mildly electrified on 50% of trials. Presentations of the nose poke cue occurred before a subset of trials to examine the effects of cue-induced craving on motivation to cross the barrier. Fiber photometric recordings of GCaMP7m were used to record bulk fluorescence of calcium-dependent neuronal activity within the PrL-mPFC in trials with and without the electric barrier task. During conflict trials, as shock intensity increased, the percentage of reinforced responses decreased. Preliminary data within an individual rat shows higher neuronal response in the PrL-mPFC during drug-associated cue presentations. For this ongoing study, we predict that animals willing to cross the electrified barrier will demonstrate addiction-like phenotypes, allowing for a greater characterization of the neural substrates involved in drug-related behavior. We anticipate that differences in drug associated cue exposure and PrL-mPFC neuronal activity may reveal differences in these phenotypes.

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University of Mississippi, with Dr. Thomas Werfel
Biomedical Engineering

Immunomodulatory Biomaterials for Cancer Immunotherapy

Cancer immunotherapy has become an effective treatment in the toolbox of oncologists. Immunotherapy offers a less toxic alternative to standard cancer treatments such as chemotherapy and can have prolonged curative effects to decrease cancer recurrence. Today, many drugs and biological agents have been developed that target the immune system and elicit an antitumor/cancer response. These agents are known collectively as cancer immunotherapies. While immunotherapies have radically improved treatment outcomes for many cancer patients, there are drawbacks to using these treatments. Immunotherapy treatments have poor clinical responses in patients with tumors that lack immunogenicity. Some of the treatments also pose a risk to induce systemic toxicity when used at high doses and risks of autoimmunity are essentially inherent. To mitigate these shortcomings of immunotherapies, biomaterials can be used as a delivery vehicle

to alter the pharmacokinetics, biodistribution, and control release of therapeutic agents targeting the immune system. This review article outlines the general design considerations of various biomaterials and their applications in cancer immunomodulation. Many studies show promising results in murine tumor models with potential for translation to human disease, but further research – via rigorous clinical trials – is needed to assess the effectiveness of immunomodulatory biomaterials in cancer patients.

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East Tennessee State University, with Dr. Diana Morelen
Psychology

The Role of Objectification and Minority Stress in Disordered Eating Among Transgender Women on Highly Visual Social Media Sites: A Mediational Model

Previous research has shown that objectification theory (Fredrickson & Robers, 1997) and minority stress theory (Meyer, 2003) may have significant harm on transgender individuals. Specifically, the role of objectification and minority stress may contribute to feelings of body dissonance and body shame in transgender individuals, which may result in engaging in body surveillance, internalization, and disordered eating and compulsive exercise (Brewster, Velez, Breslow & Greiger, 2019, Velez, Breslow, Brewster, Cox & Foster, 2016). The current study plans to examine how objectifying media contributes to disordered eating in a population of transgender women. The current study hypothesizes that objectification and minority stress will influence disordered eating through a mediational pathway of body shame and will be moderated by higher levels of victimization. Participants will be recruited on several forums as well as community outreach programs that serve LGBT populations. This hypothesis will be tested by using several scales that target experiences of objectification and minority stress as well as attitudes towards body-controlling behavior (including disordered eating).

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African American Studies/Sociology

Re-Imagining Pleasure as Self Care: An Examination of Dirty Computer Through the Lens of the Erotic

In what ways have black queer women used art to resist and reimagine normative ideas about race, gender, and sexuality? This project addresses this question through a critical reading of Dirty Computer, the 2018 release of singer-songwriter Janelle Monae. Specifically, using Audre Lorde's "the Erotic," the ways Monae's lyrics and aesthetics center pleasure and agency for black women. In general, research on black female sexuality in black feminist theory and womanist theory has focused on heterosexual sexual expressions, the policing of black female sexualities, and the sexual abuse and exploitation black women face. And queer theory tends to center whiteness and white people. To borrow the noted feminist text But Some of us Are Brave, when it comes to studying and better understanding the women's sexuality, it seems that all the "blacks are straight

and all the queers are white." Where then, does that leave black queer women? This project calls for a more inclusive discussion of black female sexuality, one complex enough to include the realities of queer black women. Perhaps most fundamentally, this project reconceptualizes "self-care," making room for desire, "the erotic," and the many other ways that queer black women reclaim autonomy and pleasure.

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The University of Kansas
Health Psychology

The Relationship Between Health Locus of Control and Growth in Interpersonal Relationships Following Trauma

This paper is framed within the context of the ongoing global pandemic, COVID-19. COVID-19 should be considered an ongoing traumatic event as it disrupts the psychological wellbeing of many as people adjust to the numerous changes imposed for protection, such as limited social contact. Being deprived of human interaction can increase rates of anxiety and depression for people in addition to the high amount of stress and worry that occurs while living through a health pandemic. While much is understood regarding trauma and its negative implications for physical and mental health, less is known about the positive growth that can occur during or following a traumatic event.

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University of North Texas, with Dr. Kevin Caffrey
Psychology

Borderline Personality Disorder: An Investigation into the College Experience

About 1.6% of the population within the United States struggle with borderline personality disorder. The age of onset for this disorder tends to occur throughout late teens to early twenties. This is often the time when young adults begin to transition into a university. This research will determine the type and degree of impact that BPD has within the university experience. After the completion of an exhaustive literature review, I intend on conducting self-reports, surveys, and/or interviews from within the population of students that attend the University of North Texas and have been diagnosed with BPD. Aspects of both academia and community will be assessed to determine whether the impacts will inhibit these individuals from having a successful college experience. I will then analyze this data and separate the findings into the degrees of impact (low, medium, and high). Lastly, I will compare my findings to the ideal "successful" university experience. I hope to demonstrate that despite the high impacts BPD might have on an individual's college experience, it is still likely that these individuals can successfully graduate and feel fulfilled at the end of their academic journey. Learning specifically about borderline personality disorder in relation to the college experience will provide an opportunity to reduce the stigma associated with this disorder as well as, contribute to better intervention, understanding, and resources within academic institutions.

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St. Edward's University, with Luis F. Avilés González
SPANISH

Bilingual Speech Production: the Spanish of Central Texas as a Case Study

The language dynamics in Texas between Spanish and English have a mutual influential relationship. As observed in Willis (2005), he provides an early account of vowel shift in the Spanish of the southwest due to contact with English. Additionally, Flege's Speech Learning Model (SLM; 1995) provides an understanding of phonetic acquisition and its relationship to the vocalic space as seen by age of acquisition (Guion et al.,2004), and instances of contact induced bilingualism (Flege, 2007 & Menke, 2009). Moreover, the exploration of race in Thomas and Ericson's (2007) study lacked depth, thus rendering the need to include race in the study (Rosa, 2016). The present study consists of eight bilingual residents of Central Texas that participated in a sociolinguistic interview (Labov 1972) and completed the Bilingual Language Profile (Birdsong et al. 2012). The results of the interview were acoustically analyzed in PRAAT (Boersman & Weenik, 2019). The F1 (height) and F2 (frontness) of stressed and unstressed vowels will be plotted using R studio. The expected results of the study aim to shed light on the relationship between the external (societal) and internal (linguistic) factors that influence the vowel space of Mexican American Bilinguals in predominantly small rural Anglo speaking communities.

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African American Studies/Sociology

Mental-Health Effects of COVID-19 on African American College Students

This research considers the effects of the novel coronavirus on the mental health of African American college students, a group that already faces heightened challenges to their emotional well-being. A brief online survey for Tougaloo College students patterned after a nationwide survey of psychological distress among Chinese people during the COVID-19 epidemic was constructed. The distress scores for the Tougaloo students were not significantly different than the scores for Chinese young adults. However, the distress caused by the pandemic was overshadowed by academic concerns and other stressors. This research offers an effective, accessible method for determining the nature of stressors affecting African American college students.

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Biology

Determining the Host Ranges in Bacteriophages and Analyzing Microbacterium Phage Shocker

Bacteriophages are typically specific in terms of which bacteria host they want to infect. Some of the genes will be the tail protein genes, which are involved in determining the host range. In order to use phages as treatments for bacterial infections, phages need to have the ability to infect the particular bacteria in the patient. Phages infect all different bacterial hosts, but they do have preferences for different strains of the same bacterial species. For example, Shocker has most likely switched its bacterial host preference by picking up two genes with a hydrolase function from a Microbacterium phage that allows it to digest the Microbacterium cell wall and infect it. In order to study phages and to determine their host ranges, we used different methods, such as plaque assay, spot tests, and serial dilutions after the phage has been isolated. Bacteriophages are very genetically diverse. There are some phages that are very similar. However, they tend to have more differences than similarities. For example, Shocker is almost completely different from all other phages. Its nucleotide sequence is so unique, that only two genes, which encode hydrolases, are shared with the phage, WaterT. Shocker was annotated using PECAAN, where there were 66 protein-coding genes identified, for which 25 could be assigned predicted functions, and the genome consists of 45,431 bp long and a GC content of 63%.

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Stuttering/Fluency Disorders

The Connection Between Mental Illness and Stuttering

My current research builds off the concern that I have for individuals and their mental well-being as they work towards overcoming their fluency disorders. While Fluency disorders, such as stuttering, are often under-researched and, in many cases, overlooked, mental illness is at the forefront of many health professions. My research takes a deeper dive into the correlation between those who stutter and those who have diagnosed mental health problems. I worked under the supervision of a UWRF professor to create a pilot survey exploring the connection between stuttering and the development of a diagnosed mental illness. I distributed a pilot survey to a group of Speech language Pathologists in a small practicing clinic in the upper Midwest. After receiving their feedback, I refined my survey and plan to distribute it to a larger population of practicing speech-language professionals in the fall of 2020. My goal for this research was to determine if there is a steady correlation between people who stutter and have been diagnosed with a mental illness to see how one might affect the other. This research will be an important step in recognizing that Speech Language Pathologists would benefit from more comprehensive training on Mental illness response and counseling for their clients as part of their therapeutic work with their clients.

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University of Mississippi/Rust College, with Dr. Kirsten Swain
Journalism/Mass Communications

Understanding the Spread of Misinformation on COVID-19 on Social Media

This study seeks to identify different types of COVID-19 health misinformation on social media and patterns in misinformation posts that appeared in early 2020. Misinformation on social media can have potential harmful effects on audiences, such as stress and anxiety. The hypodermic needle theory, a lens for examining misinformation effects on social media, occurs when the media and its creators infuse messages into the minds of the audience. Research questions guiding the study examined different types of misinformation that fact checkers flagged on social media platforms to stop the spread of misinformation, as well as how fact checkers rated the posts. The content analysis utilized 25 variables to quantify the presence, meanings, and relationships of words, themes, and concepts in 186 fact-check articles from 10 fact-check sites. Statistically significant findings included differences across misinformation categories for flagged Facebook posts and tweets and across misinformation categories for truth-rated Facebook posts.

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Texas Christian University, with Dr. Anna Rosen
Astronomy & Physics

Tracing the Evolution of Molecular Outflows in Massive Star Formation

Massive star formation can be difficult to observe due to the amount of dust present in molecular clouds. These stars, although rare and relatively short-lived, dominate the amount of stellar feedback in star forming regions, fueling all star formation. To be able to locate the sites of these stars, we can look for the emission from the jets, or outflows, that they launch as they accrete material. Molecular material is entrained by these outflows from the core of the protostar, allowing us to observe them through molecular emission. Since obtaining detailed observations is challenging, to study them up close, and in real time, we can use simulations. I've post-processed a simulation using a radiative transfer tool. By looking in depth at the four molecules we've chosen: CO, C18O, CS, and NH3, I've deduced which of these is most capable of tracing the molecular outflows of massive stars. This information will aid in observational studies and gives us more information about massive stars in general. Through data analysis with python and yt, I've concluded that CO is able to trace the entire outflow, C18O and CS trace the edges, and NH3 traces the denser gas. In the future, we will continue to plot higher energy transitions for these molecules, look at the dynamic structure of the outflows, and compare directly to observations.

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St. Lawrence University, with Dr. Richard Lauer
Philosophy of Science

Models and Modality: A Modal-Semantic Approach to Theories and Surplus Structure

The Syntactic View, the Semantic View, and the Pragmatic View, three historically prevailing approaches to the structure of scientific theory, each had crucial successes and failures. This paper outlines each of those views, addresses those successes and failures, and suggests a way to synthesize the useful formal rigor of semantic approaches with the practical concerns of pragmatic approaches. This is done through a recharacterization of the notion of surplus structure in the Semantic View. The end result is a scheme for formalizing important pragmatic structures of theory.

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St. Lawrence University, with Dr. Lucia Pawlowski
Art/Design

Industrial Design: The Best and Worst of Humanity

Design is present around us. From our automobiles, to furniture and consumer electronics, design has drastically changed and improved our way of living. However, we are not aware of its influence because we have been programmed not to. The value of an arts education has declined over the years due to the passing of the No Child Left Behind Act (2002) which directed the focus of the education system to science, mathematics, and reading to measure the levels of students with standardized testing. This led to the neglect of subjects like social studies and arts, which are just as important for students in getting a well-rounded education. This project discusses the influence of design in our lives, and the importance of the arts in our society. I look at Industrial Design, a diverse field that includes the concepts, planning, and design of meaningful and sustainable products that help us live comfortably in our environment. I explore how these designs represent the best of human nature as it inspired innovative thinking like ergonomics and digital design, changed products from a targeted niche to the masses (also known as the democratization of design) and pushed for a sustainable design future. Conversely, I also examine examples of bad design that brought out the worst in humanity. This information is compiled from documentaries, literature and interviews through research, and emphasizes the importance of arts and design in our society now and for our future.

POSTER ABSTRACT PRESENTATIONS

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Baylor University, with Dr. Bessie Kebaara
Biology

Regulation by Nonsense-mediated mRNA Decay and Environmental Influences on the Pathway

The nonsense-mediated mRNA decay (NMD) pathway plays an essential role in the regulation of mRNA. Not only does the pathway degrade aberrant mRNAs, but it also regulates select natural mRNAs that encode functional proteins and contain NMD-targeting features. Many studies have been done with the budding yeast, Saccharomyces cerevisiae, that have revealed the foundations of the NMD pathway. For instance, genetic screening of this model organism has led to the identification of the three NMD factors Upf1, Upf2, and Upf3, which constitute the evolutionary conserved core set of NMD factors present in eukaryotes. Furthermore, NMD is triggered by certain target features such as long 3'-UTRs and intron-containing pre-mRNAs. Additionally, targets can be classified as direct or indirect depending on the effects on steady state levels and half-times of target degradation when NMD is inactivated. Despite containing targeting signals, certain mRNAs such as SSY5 are able to resist NMD. Viruses too have evolved to develop mechanisms to escape the pathway as well. Nonetheless, NMD has shown to be a beneficial pathway in preventing and treating a variety of diseases. NMD also plays a role in the regulation of essential metals that can turn toxic in high concentrations, yet environmental metal concentrations can affect regulation by NMD. Thus, the NMD pathway is influenced by its targets and the cellular environment, but has risen to be an impactful and beneficial regulatory mechanism in favorable conditions.

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Baylor University, with Katherine I. Magnuson and Dr. Stacy R. Ryan-Pettes
Psychology

Relations Between Severity of Substance Use and Willingness to Use Digital-Based Treatments

Due to high rates of return to substance use following treatment among adolescents, there is a need to increase post-treatment support services. The ubiquitous use of smartphones and social media by adolescents make mHealth an accessible platform for post-treatment support services. There is growing research examining the usage of digital platforms to deliver substance use treatment and intervention for adolescents. However, there is limited knowledge about individual differences associated with willingness to use digital treatment programs. The goal of this study was to examine whether barriers to outpatient treatment and the severity of substance use are related to youth's willingness to use a smartphone and other digital-based interventions. The study

provided a survey of smartphone use and digital intervention acceptability, barriers to treatment and severity of substance use to a sample (N= 57) of adolescents enrolled in outpatient substance use treatment. The results showed a significant positive correlation between barriers to outpatient substance use treatment and the severity of substance use. Also, adolescents with more severe symptoms of substance use were more likely to have used social media to post information about wanting to stop using substances and showed an interest in the use of smartphone features (e.g., text messaging, applications) and digital platforms like Facebook for recovery services. Results were not significant for relations between barriers to substance use and interest in receiving support via a smartphone or any digital platforms. The results of this study suggest the severity of substance use may be an important individual difference factor that is associated with willingness to use digital-based interventions for substance use among adolescents.

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CU Boulder, with Abdulrhman Ahmed
Electrical Engineering

5-G

5-G technology is inevitable and will foresee soon enough from communication to defense everywhere. Gallium Nitride (GaN) power amplifier (PA) is a crucial component within 5-G, and it needs to be biased ahead before usage. However, the traditional/manual biasing is ineffective, inaccurate, risky, and slows production. So, I transitioned from manual to auto biasing and used another outside chip and programmed it to control the GaN PA. The transformation of using another chip allowed me the flexibility to control, bias, and increase safety and production. Furthermore, I abled to simulate and capture how GaN PAs behave under different factors like temperature and store/burn the data into the device to work smoothly in the outside environment. As was expected, its voltage linearly dependent on the temperature.

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University of Colorado--Boulder, with Dr. Molly Gutilla
Anthropology/International Affairs

Educational Disparities in Latinx Newcomer Student Populations

This project addresses why newcomer programs have yielded limited success in high school student graduation rates and potential remedies to student achievement gap. Newcomer students are defined as recent immigrants who have limited English proficiency or limited formal education in their native countries. As a result, newcomer students often face difficulties adjusting to educational settings, from socialization to academic performance. Moreover, school districts and staff may lack the specialized training, cultural competence, and funding to assist these students. This qualitative research project provides educators insight into the experiences of newcomer students by presenting individual and collective qualitative data of the complex and evolving challenges they face and overcome daily. This project aims to encourage a deeper understanding of the social, economic, and educational disparities confronting migrant students, to inform a

reconceptualization of current pedagogical frameworks and resource allocation for migrant English Language Learners (ELLs). The qualitative data collected for this project was attained through non-structured testimonio accounts. This project drew newcomer participants from a sample of 52 students for a total of nine testimonial accounts. Through the testimonio process, mental health, language, and economic barriers emerged as the three primary challenges affecting newcomer student retention rates. These findings reflect the importance of encouraging more effective multicultural competency for educators, improved advocacy for funding and resource allocation for migrant students and increased long-term investments in lower income and migrant communities in social services and resource allocation.

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Baylor University, with Dr. Michael Korpi
Mechanical Engineering

A New Camera for Artemis

NASA is planning on taking the next step in lunar exploration with Artemis, a mission with the goal of landing the next humans on the Moon. The purpose of this project was to design a camera that can be thrown from the lander after landing on the lunar surface, but prior to the astronauts leaving the lander. This camera device must adhere to a number of limitations, boundaries, objectives, and restrictions. This includes being able to withstand the harsh, irradiated, dust filled environment of the Moon. Research on the Moon and previously used space and lunar cameras was conducted to prepare for the design process. During this process, multiple concepts were considered, analyzed, critiqued, and changed. In the end, two designs were chosen, a tri-layered, self-rolling spherical design and a tetrahedron design. It is crucial to know that this project is incomplete. Subjects such as power sources, materials, radiation shielding, etc. have yet to be explored in context to the designs chosen and will be outlined at a later date.

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Psychology

Is My Body a Cage?: Radical Dualism and Religious Orientation

Studies that have focused on Terror Management Theory (TMT) and religious orientation hone in on the characteristics and emotions tied to the fear of death, such as anxiety and depression, specifically as those emotions impact how one orients towards one's religious convictions. Prior research in TMT suggests that the human body can function as a reminder of mortality which in turn creates a motivation to dualistic understanding of self as body and soul. In the present study, it was hypothesized that religious orientation would be a contributor to one's belief in dualism, such that there would be a positive correlation between security-focused orientation and one's belief in dualism. On the other hand, it was hypothesized that a growth-focused religious orientation would be negatively correlated to dualism. Participants consisted of 222 adults, mostly university students, from two private Christian colleges in the Midwest. The participants completed a survey

online, which included the Radical Dualism Scale, Defensive Theology Scale, and the Batson Quest Scale. Our study found that while there was a positive correlation between Radical Dualism and Defensively Oriented people, there was no correlation between Radical Dualism and Existentially Oriented people. It is important to go beyond measuring one's religiosity, or how religious they feel they are, and to begin studying how we function psychologically through religion. How does it make people see the world, death, and even their own bodies?

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Southern Nazarene University, with Dr. Scott Drabenstot
Psychology

Hope Across Borders: A Look at How Culture Influences Hope

Snyder's Hope Theory suggests people achieve goals through finding pathways and having the agency to do so (Snyder, 2002). This study aimed to see how certain aspects within culture affected levels of hope in an individual. Data was collected from several cities in Costa Rica as well as a broad range of people from the United States to see what types of cultural factors exist within the two regions as well as how they influence the perception of hope, including hope and dimensions within collectivism and individualism. Hope was more strongly correlated with individualism and collectivism in the country of Costa Rica than it was in the United States. This data suggests hope is more strongly influenced by interpersonal relationships in Costa Rica than in the United States.

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Emporia State University, with Dr. Tracy Wechselblatt
Psychology

The Impact of Adverse Childhood Experiences (ACE) on Adult Health and Mental Health

This study examines individual Adverse Childhood Experiences (ACE) components and its effects on health outcomes in adulthood. "[ACE's] are associated with premature death, risk behaviors, increased comorbid conditions, and chronic disease such as cancer in adulthood" (Xuening Chang, 2019). My participants are mental health providers and 100 of their adult clients (18 and over) at a local community mental health center that has a catchment area of several areas in the state of Kansas. The clients filled out the ACE Survey along with the Demographic Survey that breaks down their health history along with their family's history as well. The Project Director is looking up the client's DLA-20 that they have on file and once all materials are completed, they will send the data directly to myself so I can begin data analysis. Statistical Program for the Social Sciences (SPSS) will be used for analysis and Tukey tests and ANOVAs have been proposed as appropriate models of data analysis. After finalizing this study, I expect to find a strong correlation between individual ACEs and health outcomes in adulthood. This study can eventually help those with ACE try to reduce the likelihood of an expected mental illness based on their specific ACE. Clinicians will benefit from this information as well because if they know that there is a correlation between individual ACE and mental illnesses, they will be able to better target treatment to decrease the likelihood of mental illness in adulthood.

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Neuroscience - Prospective Memory

Gender Differences of Prospective Memory in Relationships and the Workplace

Prospective Memory (PM) has been shown to be used differently between males and females. Past research supports that females in a heterosexual relationship are often responsible for both their own PM tasks as well as those of their male partner, which can place a mental burden on females. To answer several questions and test our hypothesis involving PM, the survey results from 204 participants covering the participants' to-do lists, as well as their estimations of their partners' and boss' to-do lists were used. Our results showed that males and females were aware of the PM task-load discrepancy between them, both in romantic relationship and between the participant and their opposite-gendered boss. Additionally, we showed that age did not correlate with PM task evenness, but rather that relationship length did for overall and work tasks (decreasing evenness) as well as social tasks (increasing evenness). Investigation into relationship satisfaction and PM task-load balance showed no correlations four of the five categories of PM tasks, except for personal/health tasks showing improved satisfaction. A similar investigation into boss satisfaction found improved satisfaction in overall and personal/health tasks when the boss had more than the participant, while work PM task-load comparisons had no bearing on boss satisfaction.

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Computer Science

Simulating Goal-Oriented Social Interaction in Confined Spaces via the Social Force Model

In this project, a simulation following the headed and non-headed Social Force Models was implemented. The notable contribution was an implementation of the desired heading force as randomly generating 'goal' locations. A model such as this can be used to simulate movement within a confined space where goals are met successively, such as supermarkets, where location within a confined space, a 'goal-state', dictates preferred direction of movement. Movement such as this fits the movement characteristic of essential locations during a pandemic such as supermarkets and hospitals, where pedestrians move around to fulfil a task.

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Neurobiology

Abnormal cytokine activity as a potential contributor to C9ORF72 dependent neurodegeneration

Amyotrophic Lateral Sclerosis (ALS) is a fatal and incurable neurodegenerative disease marked by the loss of motor neuron (MN) function leaving the patient unable to use their muscles. Frontotemporal Dementia (FTD), presents with the loss of cortical neurons in the frontal lobes

of the brain leaving FTD patients confused and with behavioral issues. On the surface, ALS and FTD seem like very different diseases. However, a hexanucleotide repeat expansion at C9ORF72, has been determined to be the most common mutation in both diseases. For the past thirty years, most research on neurodegenerative diseases has focused on the cell autonomous aspect of the disease. However, it has now become evident that non-cell autonomous events, mainly neuroinflammation imposed by the glia in the disease niche, is a hallmark of all neurodegenerative diseases. I am currently using human induced pluripotent stem cells (hiPSCs) derived from healthy patients and patients suffering from C9ORF72 ALS and FTD to try to model the inflammatory cascade present in neurodegeneration. The hiPSCs are differentiated into motor neurons, cortical neurons, astrocytes and microglia, providing me with a supply of cells otherwise impossible to harvest from patients. Using reverse transcription-polymerase chain reaction to quantify RNA transcription for genes involved in different aspects of the astrocyte inflammatory response, data suggests that astrocyte carriers of the C9ORF72 mutation have an aberrant reaction to inflammatory signals compared to heathy astrocytes. Those astrocytes also show an abnormal cellular morphology. This seems to suggest that an atypical inflammatory response might contribute to C9ORF72 ALS and FTD.

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International Affairs and Political Science

Assessing Ddevelopmental Approaches Since the Mid-20th Century and its Outcomes for the Underdeveloped Countries

This paper employs an empirical analysis of the extant literature on development in the Global South from both Western states and the East, particularly China, to critique both failed policies. Beginning with Western economic development in the past decades from Structural Adjustment Programs, the opening of free trade, Millennium Development Goals, and Sustainable development goals designed to improve the Global South, it shows how each of these policies failed or met with limited success, which meant the Global South continued to lag in progress, trapped in abject poverty. The West's failed policies not only increased the Global South's poverty, pollution, political instability, and social fragmentation but also led to China's momentum to offer an alternative development. Some scholars regard this as a 21st-century recolonization of the Global South by China. Presently, Chinas' "One road, many dreams" anticipate developing underdeveloped countries. Despite China's focus on infrastructure development and non-political interference, a careful evaluation suggests more dilemmas from China's policies. This paper reviews the pervasive development stage and its consequences in Niger Delta, Laos, Burman/ Myanmar, and Sri Lanka after previewing this background to argue that these policies helped facilitate human insecurity, instability, and environmental disaster, therefore warrants a holistic developmental approach in Global South.

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Biomedical Engineering

Design of a Platform to Study Cell to Cell Communication in Osteoarthritis

Osteoarthritis, the most common form of degenerative arthritis, is caused by the deterioration of the cartilage, causing joint pain and inflammation. In particular, the decay of the interface separating bone and cartilage that occurs during disease progression, results in new interactions between osteocytes (bone cells), chondrocytes (cartilage cells), and stem cells, among others. To better understand the impact of this altered cellular communication, we are creating a platform that will enable for the study of contact-dependent cell-cell communication with single cell control in mixed cell population. First, we will synthesize and purify photoactivatable molecules that will allow for direct control over the placement of different cell types. Then, using this patternable molecule with cleanroom-free photopatterning techniques, we will investigate how gap junction proteins modulate communication between stem cells, osteocytes and chondrocytes, and how this communication may lead to dysfunctional states. Completion of this project will result in the creation of novel functional models for studying osteoarthritis progression.

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Sonoma State University, with Dr. Lena McQuade
Women's and Gender Studies/Chicano and Latino Studies

Sexual Health and Sex Education Access Among Latina College Students

This research proposal aims to find new methods to increase access to sex education among Latinas. One of the objectives of this study is to explore how as a society and medical professionals can find new ways to improve sexual health education and make it more inclusive among Latina college students. The significance of this study is to raise awareness of sexual health among Latinas and the merit of this study is to ask how Latinas define good sexual health and safe sex in their own words. The literature highlights the experiences and barriers Latinas face when accessing sexual health and sex education, including the importance of introducing the topic of sex at a young age and cultural stigmas regarding sex education and sexual health. Doing semi-structured interviews, will help analyze the areas in which sexual health education can be more accessible to Latinas and how medical professionals can improve this ongoing issue.

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Southern Nazarene University, with Dr. Kim Rosfeld and Mrs. Jocelyn Gordon
Political Science/Humanities

Social Identity, Legality, and Immigration: The Effects of House Bill 1804 on Hispanic or Latino Communities in Oklahoma

This project examines the intended and unintended effects of Oklahoma House Bill 1804 toward the Hispanic or Latino community of Oklahoma. The law makes it a felony to shelter, harbor, and

transport any undocumented immigrant. It also restricts undocumented immigrants, including infants, from using public services such as health care and education. This law was created in an effort to stem undocumented persons in the State of Oklahoma. This qualitative study of the impact of one immigration law consists of collecting quantitative and qualitative data from Oklahoma newspaper articles and journals, peer reviewed scholarly articles, and empirical and data-driven evidence from Southern Nazarene University's private database. The article introduces identity formation and legality as theories. The findings demonstrate that H.B. 1804 created negative stereotypes and strong animosity toward the Hispanic community, shaped an atmosphere of suspicion and bigotry, created unintended consequences toward many Oklahomans who are citizens, and created economic hardships within the State. The purpose of this research was to examine the impact of H.B. 1804 and evaluate how well it aligns with the goals of its writers and what unintended consequences it created. Additionally, this research aimed to explore the relationship of social identity theory and legal theory with H.B. 1804.

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Biology

Size Scaling in the Skull of North American Felids as Adaptations for Prey Acquisition

Statistical evaluations of skull measurements within and between the three selected North American carnivore groups allowed it to be determined which features scaled with body size; skull length, jaw length, and tooth row length. Additionally, some of these skull features showed significant correlation with the body size of possible prey, indicating there are limitations on prey size based on skull parameters related to bite strength. When compared against body size, measurements relating to the temporalis muscle didn't fit the regression lines as well as other data, indicating that the temporalis doesn't scale directly with body size which is a major component in bite strength differences related to prey size that can be taken. Across all families, the moment arm of the temporalis and the zygomatic arch width showed significant differences between species within a family. In most comparisons, temporal fossa width differences were also significant.

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Biology

Olfactory Affects on Oviposition in Aedes aegypti: An Exploratory Study

Abiotic factors, such as water vapor, hydration, or visual structure of potential oviposition sites can influence mosquitoes' egg-laying behavior. In contrast, biotic factors like chemical compounds that are produced by aquatic organisms may have greater impacts on oviposition site selection. For example, larval food source, predators and competition may alter the oviposition site of choice. Female mosquitoes will select oviposition sites that are optimal for offspring due to forces of natural selection. Mosquitoes have chemosensory receptors to help them identify various resources such as blood feeding hosts, potential mates, nectar sources, and oviposition sites. For

this research we have examined the influence of scent on oviposition behavior in the mosquito species, Aedes aegypti. Prior research has shown that geosmin, a chemical compound found in beetroot peels, can affect mosquito behavior in a positive manner as female mosquitoes have shown oviposition preferences for this odor. Different chemical environments can lead to distinct oviposition behaviors. In our study, we tested the hypothesis that female mosquitoes would display a preference for beetroot or geosmin, over oak leaf and distilled water when placed in an oviposition assay. The experimental test of this hypothesis was accomplished by comparing the number of eggs in a dual choice setup. The study of oviposition behavioral patterns is essential to understanding the global distribution of vector mosquitoes and the increasing incidence of dengue fever, and the re-emergences of yellow fever and Zika, which are all transmitted by Aedes aegypti and/or Aedes albopictus in the western hemisphere.

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Chemistry

Learning From Home: Conductometric Titrations

While conductometric titrations have long been a standard technique in analytical chemistry, the complexity of the apparatus needed had caused this method to be in many cases replaced by potentiometric titration upon the advent of inexpensive and convenient pH meters. However, the more recent availability of accurate conductivity probes such as the Vernier line has sparked a renewed interest. Therefore, it was desirable to undertake a review of systems amenable to conductometric titration, which includes not only acid-base systems but also salts and complexes. Due to the widespread impact of Covid-19, we concentrated on the development of a “kitchen chemistry” conductometric titration lab which can be done at home, with inexpensive and safer reagents. The example of forming a boroglycerol complex from Borax® and glycerol as a substitute for the boric acid-mannitol system is explored in detail.

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Trinity University, with Dr. Sussan Siavoshi
Political Science

Pawns at Play: Refugees and the Game of Foreign Policy

For forty years, Pakistan has consistently been among the world’s largest refugee receiving nations. By accepting millions of Afghans in the 1980s, Pakistan adopted a relatively open-door refugee policy. However, since the 1990s, Islamabad has tightened its visa restrictions, closed refugee camps, and aggressively pursued repatriation. What explains such a drastic shift in Pakistan’s refugee policy? Most researchers focus on internal socio-economic factors when explaining this shift, but this project seeks to consider the role of foreign policy in understanding Pakistan’s treatment of refugees. The purpose of this poster is to illustrate my findings and showcase Pakistan’s historical treatment of its refugee population as a pawn in its game of chess against India. The nexus between Islamabad’s foreign and refugee policy is seen through the order of

events on my timeline, showing a noticeable linkage between increases in Indian power projection and the tightening of Pakistan's refugee policies.

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Psychology

Multiple Stressors Affecting Anxiety and Depression in College Students

There are a multitude of factors that affect college students' mental health and well-being. Students often endure many obstacles that can severely hinder their ability to function and succeed throughout their academic career. According to Andrews and Wilding's (2004) study, among UK students who exhibited no psychological symptoms before college, 9% were diagnosed with depression, and 20% were diagnosed with generalized anxiety disorder halfway through their college career. Furthermore, many students are unaware of the resources available within their institution that are designed to help minimize their levels of stress and anxiety. Without this knowledge and awareness, students' symptoms are often exacerbated. In this study, an examination of multiple academic and non-academic stressors on depression and anxiety in college students was conducted. We replicated McIntyre et al.'s (2018) research, measuring several predictors of anxiety and depression: financial worry, academic stress and performance, work status, student involvement, loneliness, social support. In addition to these factors, we also assessed students' counseling attendance and their response to the COVID-19 pandemic. A 52-item questionnaire was administered online through Qualtrics, and we have received a total of 279 responses thus far. Tentative results indicate that academic stress and students' own expectations are both significant predictors of anxiety. However, there was no correlation found between students' financial worry and their psychological well-being. The purpose of this study is to understand the multiple stressors that college students endure and how counseling affects their ability to cope with these stressors.

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Forensic Psychology

Auditory Hallucinations Within the D/deaf Schizophrenia Population: Bias Analysis Within a Criminal Case

There has been little research conducted on the D/deaf population and their mental health. Even fewer studies have been conducted on the symptoms the D/deaf experience when they have schizophrenia. Schizophrenia is a psychiatric disorder characterized by psychosis, hallucinations, delusions, disorganized speech and behavior cognitive deficits, and occupational and social dysfunction. The hallucinations that occur can be visual, auditory, gustatory, tactile, or olfactory. It has been reported in some studies that D/deaf individuals who became deaf after birth report hearing voices, but individuals who were born deaf instead experience a hallucination within their mind where there is someone signing to them. Within this project we plan to analyze the already existing literature on the D/deaf population and their experiences with schizophrenia. We also plan

on conducting a study where we analyze participants' response to a case study where they are presented with a schizophrenic individual, either deaf or hearing, and see if they will be sentenced to prison or to a mental facility and for how long by the participants. The goal of this research is to measure whether or not there is a bias when it comes to sentencing the mentally ill. By observing and measuring how each participant responds, a clearer understanding of how the Justice System should approach the mentally ill in regard to sentencing and treatment can be quantified and discussed. We hypothesize no difference between defendants but predict a higher sentencing recommendation within a mental facility.

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University of North Texas, with Dr. Kimberly Wren
Anthropology

Ceramic Preferences Among the Ancient Southwest

There are many studies on symmetry, materials, techniques, distribution, trade networks, and metaphors that relate to ceramics and social structure, but fewer studies on preference. This study seeks to determine which motif designs and design styles were preferred over others by Hohokam, Mogollon, Casas Grandes, Salado and Ancient Pueblo groups in the prehistoric Southwest from A.D. 200 - A.D. 1400. By examining motif preference, we better understand changes in prehistoric peoples' social structure that relate to cultural identity and ideology shifts as well as environmental changes. Moreover, understanding preference might demonstrate how agency, within a particular context, is negotiated and reflected in the archaeological record. This study ultimately examines the role of preference in the evolution of material culture. I documented the presence of triangle, multiple parallel line, and Flower World motifs on vessels from the Dallas Museum of Art. I placed each vessel into a temporal cohort and ran chi-squared or Fisher's exact tests on presence/absence data to determine whether differences in motif design frequency and motif design style frequency during each temporal cohort existed at the ($p \leq 0.05$) significance level. The only reliable findings show that the distribution of one form parallel lines and acute and obtuse triangles was significantly different between Ancestral Pueblo and Mogollon during Cohort 2 (A.D. 900 - A.D. 1149) ($p \leq 0.05$). Despite these groups' adjacent locations, they preferred different motifs styles indicating possible differences in social structure and individual agency. Future research, including increased sample size, is necessary for more reliable results and comparisons.

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Biochemistry

Analysis of the Antimicrobial Efficacy of Nano-Engineered Silver Coatings

Silver nanoparticles (AgNPs) are one of the most used metallic nanoparticle constituents due to the unique, yet unknown mechanism as an antimicrobial. The use of AgNPs maintains its validity due to the inability of bacteria developing resistance to the silver ion's ability to accumulate within the bacterial cell. The antimicrobial nano-alloy (ANA) being tested has been formulated and patented by

the West Texas A&M University Department of Engineering as a means of bacteriological corrosion prevention. However, the strides that the product has made as an all-around, non-volatile means of antimicrobial effectiveness deems worthy for further testing in a wide array of application. Buffalo Technology Group (BTG) has created this antimicrobial nano-alloy (ANA) paint that is the result of combustion synthesis which creates many small tangible pores that greatly increase the product's surface area, leading to an increase in active surface in antimicrobial receptiveness. Methods include an overall compliance of aseptic technique along with facilitated time-kill tests to test the overall efficacy of the product with standardized aliquots of bacteria and peusdo-Kirby-Bauer tests to better understand the diffusion and possible leaching of the product. Due to the ubiquitous nature of bacteria, even places that are meant to be sanitary for the better of social health such as hospitals and daycares are not left out in this gross understatement. Recent tests that have shown viable results with this product include underwater pipeline corrosion prevention and the inner lining of pasteurized dairy storage to prevent contamination from common soil dwelling bacteria.

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Psychology

Acculturative Stress, Mental Health and Academic Engagement of Young Adult Hispanic Immigrants

Hispanics are the largest minority population in the United States today, and the numbers are rising. The amount of discrimination toward the Hispanic population is rising as well, it takes a toll on minorities. The present study examines the levels of acculturative stress and its relationship to internalizing symptoms (anxiety and depression) and academic engagement. Participants included 209 rural area college students, which were comprised of 140 Caucasian Americans, 50 Hispanics, and 19 students from other racial backgrounds. Various scales measuring academic engagement, depression, anxiety, and academic engagement were compiled into an online survey. Results indicate that Hispanics do experience significant amounts of acculturative stress, and this acculturative stress was a significant predictor of anxiety and depression for these students. Additionally, Hispanic students showed a significantly higher level of depression than their Caucasian counterparts. Lastly, the study found that academic engagement levels were significantly predicted by depression for Hispanic and Caucasian students and acculturative stress for all students, regardless of race. These findings suggest that Hispanic immigrant students in rural areas are vulnerable to mental health problems and would benefit from institutional efforts to support wellness and academic engagement. Future research should continue to examine rural areas, perhaps in different political regions or type of academic institutions, in order to evaluate the extent to which these results hold across diverse populations. The researcher would like to thank Dr. Bryan Dawson, UNG McNair Scholars program, UNG Honors program, UNG LSA, UNG MSA, and UNG CAMP for assisting with the research.

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Psychology

Judgments and the Perceived Controllability of Social Identities

Why do people seem to feel like it is ok to judge others based on certain social identities (such as political orientation or college major) but not others (such as gender or race)? This research project examines whether the belief that a certain social identity is controllable (i.e., a matter of choice) affects whether people feel it is appropriate to judge or stereotype others based on that identity. In an initial Study 1, 119 participants examined a list of 22 different social identities or social categories. Participants were asked to rate the extent to which they felt each social identity was a matter of choice. They were also asked how appropriate they felt it was to judge others based on that identity, and how accurate they felt stereotypes about those social identities were. The results of this study showed that the more people view an aspect of a person (e.g., education, political orientation) as a matter of choice, the more they will judge and stereotype them for it. Our research this year will be focusing on one specific social identity – social class. We will be running an experiment in which we manipulate whether social class seems controllable or not (using newspaper articles with a few words changed to make it sound like people either do or do not have a choice over their social class). Our goal is to test whether manipulating perceptions of social class as controllable or not changes peoples' attitudes towards people of different social class backgrounds.

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Psychology

The Disproportionality of Young Children from Linguistic and Culturally Diverse Backgrounds With Autism Spectrum Disorder

Autism Spectrum Disorder (ASD) is a neurodevelopment disorder that is characterized by difficulties within one's social communication, interactions, and sometimes restricted and repetitive patterns in behaviors, interests, and activities. With that being said, research in ASD has shown there are interpersonal and intrapersonal characteristics that influences the disproportionality of young children from culturally and linguistic diverse (CLD) backgrounds with ASD. In detail, disproportionality has been shown to affect one's diagnoses, services, and availability of resources, (e.g., race, ethnicity, socioeconomic status, gender). Thus, this research project explores the interpersonal and intrapersonal characteristics that influences the disproportionality of young children from CLD backgrounds with ASD. Within the study, the participants are parents/caregivers of young children who have an ASD diagnosis or anticipated diagnosis, living in the U.S. More specifically, the intrapersonal traits that are disclosed in the study will be explored through a mixed method design to better understand the number of traits and identities that the participants may associate with and the types of services their child receives. Moreover, these extents are to be done qualitatively, seeking the measures of the individual's quality of life with the faced environmental characteristics of disproportionality from their ASD diagnosis.

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Baylor University, with Dr. Davide Zori
Anthropology

The Variety of Variables That Affect Etruscan Burial Practices

This is a small literary review on the literature currently available on Etruscan burial practices. The initial research question was simply to answer how did Etruscans, bury their dead, but during the research phase it became clear that there is no single simple answer to that question. This poster focuses on five main variables: geography, time, social status, sex, and age. Each of these variables affects the way an Etruscan was buried in a different way and the culmination of these variables is what makes the initial question so difficult to answer succinctly.

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Computer Science

Popularity in Three-Dimensional Stable Marriage with Ties

Popular matchings have been thoroughly studied in the context of Stable Marriage, which consists of a set of men and a set of women, collectively referred to as agents. The men have strict preferences over the women, and the women have strict preferences over the men. A popular matching is an assignment of man-woman pairs that never loses a majority vote between another matching. For instances of Stable Marriage, there is a polynomial-time algorithm to find popular matchings. Stability has also been well studied in three-sided stable marriage, where many relevant problems are NP-complete. To continue characterizing popularity in the context of stable marriage, we study popular matchings in a three-sided variant of SM that allows agents to express indifference on their preference lists, called Three-Dimensional Stable Marriage with Ties. First, we describe an instance of Three-Dimensional Stable Marriage with Ties that admits no popular matchings. Finally, we use this instance as a gadget to construct a polynomial-time reduction from the Three-Dimensional Matching decision problem to show that deciding whether an instance of Three-Dimensional Stable Marriage with Ties admits a popular matching is NP-hard. Next, we aim to describe the complexity of deciding if a popular matching exists in a variant of this problem where agents do not allow ties on their preference lists.

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Environmental Geochemistry

Field Speciation of Hexavalent Chromium: An Alternative Method

An alternative method for field speciation of hexavalent chromium has been tested against the USEPA's 218.6 method. This method, which consists of passing samples of water through cation-exchange resin can be done on-site and overcomes strict regulatory standards of the USEPA method. The cation-exchange method can be done on-site, requires inexpensive materials, and

provides accurate results. The USEPA's method has strict time constraints and must be analyzed within 24 hours of sample collection. This method also requires two analytical techniques which might create small biases in results. Data collected from field studies in Hinkley, CA using both methods suggests the cation-exchange method to be more accurate than the USEPA's 218.6 method.

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Southern Nazarene University, with Dr. Caio Martinelle França
Biology

Identification of Mosquitoes in Oklahoma

Mosquitoes have an important role in our ecosystem as pollinators but they can also have a negative impact because they can spread viruses, making them one of the most dangerous animals in the world. The purpose of this research is to describe mosquito communities in Oklahoma and detect the presence of medically important vector species. To capture mosquito diversity, we used three types of traps, CO2-baited CDC light, CDC Gravid and gravid Aedes traps, on 12 different sites in the Oklahoma City metro area from May to July of 2020. Mosquito trapping locations ranged from urban to rural areas, spanning four counties in Oklahoma. Our sampling efforts resulted in 2,511 female mosquitoes of 26 species from six genera (Aedes, Anopheles, Culex, Coquillettidia, Orthopodomyia and Psorophora) collected over 213 trapping nights. Our initial report shows one new species, Aedes stimulans, that have not previously been recorded in Oklahoma.The Culex pipiens/quinquefasciatus complex (35.64%), Aedes vexans (15.61%), Psorophora columbiae (16.41%), Aedes albopictus (12.51%), are the Five most abundant species and they are accounted for (80.17%) of the mosquitoes collected from this project. Knowledge of mosquito composition and abundance is important as it can inform public health applications.

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University of Colorado Boulder, with Alicja Hudson
Environmental Design in Architecture

Post-Pandemic Urban Living

The goal of this research was to develop a solution to understand how our urban living and working settings begin to mingle as Architecture and the Built Environment change with the repercussions of SARS-CoV-2, otherwise known as COVID-19. Much of the development came through online research of architectural firms and their response to dynamic change, various personal insights to how people are reacting to their current inhabited space across the world and even precedents of how history has had to respond to previous outbreaks. After extensive analysis, findings show that individuals are anxious about large city settings, but they need not be. Urban density isn't the issue, simply the quality of the environment itself. The findings may be useful in redesigning urban spaces and buildings.

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Psychology

The Impact of a Compassionate Love Writing Intervention on State Attachment to God

Attachment has been a topic that has been explored through research for many years by various researchers. The purpose of the current study is to determine whether or not reflecting on past experiences of giving or receiving compassionate love has made an impact on state attachment to God. In the present study there were three hypothesis that were tested. The first hypothesis was reflecting on an experience of giving and receiving compassionate love will result in less state attachment anxiety toward God, compared to reflecting on an everyday experience. The second hypothesis was reflecting on an experience of giving and receiving compassionate love will result in less state attachment avoidance toward God, compared to reflecting on an everyday experience. The last hypothesis was Reflecting on an experience of giving and receiving compassionate love will result in greater state attachment security toward God, compared to reflecting on an everyday experience. The participants were asked to answer a series of questions including the attachment to God scale and then were asked to take 5 minutes to reflect on an assigned prompt. There were 3 different prompts that included giving compassionate love, receiving compassionate love, and an everyday experience(control). My analyses will include three one-way ANOVA's testing how reflecting on giving/receiving compassionate love will impact state attachment to God.

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Sociology/Humanities

Investigating Quality of Life Differences: First-Generation vs. Generational College Student Experiences at Baylor University

Despite research on first-generation college students' experience citing Impostor Syndrome as a result of negative experiences, it has not been considered that Impostor Syndrome is a non-negotiable factor of the first-gen experience that leads to negative outcomes unique to first-gen populations. As researchers begin to analyze the psychosocial and cognitive experiences of first-generation college student experiences, it is important to trace experiences of Impostor Syndrome throughout such analyses as its pervasiveness in first-gen experiences becomes increasingly evident. This study addresses Impostor Syndrome and class differences by analyzing the quality of life for first-gen college students and generational college students at Baylor University. With 158 anonymous survey responses, 60 first-gen experiences and 98 generational experiences were represented. Participants' responses were coded with IBM SPSS to find frequencies that reveal common patterns unique to each distinct student population. It was hypothesized that the difference in quality of life for these two student populations on the Baylor campus would be an issue of socioeconomic class differences. Results confirmed this hypothesis as financial independence and instability is most visible in Baylor's first-generation college student population. These findings suggest that a students' college experience is dependent upon their socioeconomic status, which then facilitates impostor feelings within first-gen students. This project would not

have been possible without the support of the Baylor McNair Scholars program or Dr. Coretta Pittman.

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Criminology

Prisoner Reentry: College Perceptions of Reentry Barriers in a Northwest Community

The United States has experienced an enormous rise and fall in crime rates, while incarceration rates have continued to soar. One of the many pressing concerns within the era of mass incarceration, especially in times where decriminalization of drug offenses is more prominent, is fluctuation of incarcerated individuals returning to communities and resources needed for successful reentry. This study is focused on community perceptions of college students toward barriers faced; regarding incarceration, prisoner reentry, and improving recidivism rates in communities. Qualitative data are collected from interviews and focus groups conducted in an Inland Northwest community, to shed light on the community's perception of barriers to reentry that might interrupt successful reentry for inmates or that may be viewed as more helpful for inmates' successful reentry. This research extends our understanding of community perceptions of barriers faced in interrupting the cycles of incarceration as well as provides an assessment and evaluation of what exists, what is needed, and what has worked in this community. The research has implications for local criminal justice reform and efforts to better provide services and resources for returning inmates.

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Physics and Mathematics

The Search for a More Cost-Effective Nitrate Reduction

Nitrate (NO3-) is one of the most common contaminants found in groundwater. The contaminant infiltrates subterranean water from wastewater systems, agriculture, and other human activities. Since NO3- is converted into toxic compounds within the human body, it renders the consumption of groundwater undesirable. Current solutions to denitrify groundwater through biological methods and ion exchange have unique drawbacks. Catalysis presents an alternative to these, though palladium (Pd) is quite costly, prompting studies into more cost-effective catalysts for nitrate reduction. Researchers have previously studied PdxAu100-xNPs and PdxAg100-xNPs as candidates for nitrite (NO2-) reduction catalysts and have shown that both have a marked increase in activity over similar PdNP catalysts. Herein, we will further our understanding of both PdxAu100-xNPs and PdxAg100-xNPs by coupling it with indium (In; a promoter metal) to analyze the reduction of NO3- into the favorable nontoxic nitrogen gas (N2). The alloyed nanoparticles will be synthesized using a microwave-assisted method, before being characterized to confirm random alloying. The activity of our PdAuNP/In and PdAgNP/In catalysts will be analyzed by monitoring the decomposition of NO3-, the formation of intermediate species (like NO2-), and the selectivity to N2 or ammonia (NH3) as the end-product.

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International Affairs

Propaganda: USSR and US Comparing Propaganda from the US and USSR Produced for the Advancement of Public Approval for Hydro-projects in the 1930s

The Soviet Union (USSR) came into power in the late 1910s tearing down the long-standing Romanov regime. Known for its massive propaganda scheme and anti-United States (US) rhetoric, Soviet propaganda was ingrained in history books throughout the western world. The United States continually denounced the massive use of propaganda in the Soviet Union through the regime's lifespan, from its beginning to its collapse. Unknown to the public of this era is that the United States contributed in similar practices of state sponsored artwork, photographs, music, and publications rebranded as promotional work instead of propaganda. For example, when building the Grand Coulee Dam in the state of Washington the US produced music and commissioned photographers to inspire hope during the great depression. Similarly, the USSR had a state sponsored magazine The USSR in Construction to document and show the public, and foreign nations, the monumental works the government was building to modernize the state. This project focuses on 4 separate case studies of public work projects from both states and the propaganda affiliated with each work, with a goal of identifying similarities and differences in each actor's use of propaganda during the interwar period. Furthermore, this project will bring awareness to American audiences about the use of propaganda and the influences on its public during the interwar period which duplicate USSR strategies and may be seen today.

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Cognitive Science

Investigating Artificial neural networks optimized for ecological auditory tasks as a normative model of pitch perception

Pitch perception is an important aspect of human hearing thought to underlie complex auditory tasks, such as separating concurrent sounds, recognizing voices, and following melodies. While pitch is traditionally considered the perceptual correlate of fundamental frequency, naturally-behaving listeners are rarely asked to explicitly report the pitch of a sound. Thus, in order to investigate how human pitch perception may have been shaped by the demands of ecologically-important tasks, we trained deep artificial neural networks to perform different combinations of three tasks that are ecologically important to humans (speech, voice, and environmental sound recognition) using simulated cochlear representations of speech excerpts superimposed on recorded auditory scenes. We then interrogated networks for learned representations of pitch by training linear classifiers on the networks' internal activations to perform psychophysical experiments, such as two-tone pitch discrimination. These classifiers enabled us to measure thresholds from networks trained to perform arbitrary tasks. We compared the effect of stimulus manipulations previously used in psychoacoustic experiments (e.g. inharmonic vs. harmonic tones,

low vs. high-numbered harmonics, sine vs. random phase) between network and human listeners. These comparisons can shed light onto how pitch perception facilitates everyday auditory tasks. Comparisons between networks trained on different tasks also provide hypotheses for potentially distinct pitch mechanisms specialized for different aspects of audition.

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Psychology & Computer Science

Does Voice Really Matter? The Impact of Voice on Effort and Recall

Computer-generated speech is becoming more commonplace in daily life. Due to this, it is important to make a close examination of the impact of voice on effort and recall. There have been some studies that examine how a voice effects effort and recall, but most of these studies include some form of visuals and do not focus solely on voice. The current study investigated participants' recall performance and effort ratings of an audio agent when information is presented by either a classic audio engine, modern audio engine, or a human voice. In an online setting, participants were placed under cognitive stress by being showed a 5-digit number to memorize for 15 seconds and then instructed to listen to an audio lecture divided into three segments. Each segment of the audio lecture was presented by a different voice. Participants were asked to provide the 5-digit number from before the lecture. On the Nasa-TLX, participants provided their ratings of the effort each segment's tasks took. Lastly, participants answered free recall and multiple-choice questions about the content of the audio lecture. The findings indicate that voice has medium effect on effort. Participants found the classic voice the most effortful and the human voice the least effortful. Participants also had the best recall performance in the human voice condition and the worst recall performance in the classic voice condition. These findings can guide future research on audio-only information processing and have important implications for the design of voice assistants, screen readers, or educational materials.

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Sociology

Preventative Healthcare Measures for Diabetes

There is a significant problem with diabetes and preventative measures for diabetes for Native Americans. This study will seek to understand the preventative measures for the Eastern Band of Cherokee Indians (EBCI) and the Navajo Nation concerning diabetes. The research will examine the differences between the Navajo Nation and the EBCI in various ways about the issue of diabetes. The proposed method will recruit participants through an initial survey and follow up with a focus group setting. The plan is to find those who have diabetes and conduct a focus group to determine the individual voices of each tribe and their concerns and more of the preventative measures for diabetes.

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Molecular, Cellular, and Developmental Biology

Machine Learning to Predict Anti-Malarial Compounds

We need to better streamline anti-malarial drug discovery in response to the emerging drug resistances in malaria parasites. We used an Artificial Intelligence (AI) program ChemProps to predict new anti-malarial compounds. The neural network program relies on training, which I carried out using a chemically diverse set of 20,000 established antimalarial compounds previously reported in the literature. A high positive rate (70%) observed with implementation of the program in known antimalarial compounds suggests that with training, ChemProps can capture broad features of antimalarials. In the Broad Institute's Drug Repurposing Hub catalogue of 7,000 compounds, the program predicted ~25% to be anti-malarial. My preliminary findings, obtained with limited computing capacity, suggests that AI-based approaches may prove powerful as a mode of screening compounds for antimalarial inhibitors.

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Psychology/Neuroscience

Opioids and How Stressor Controllability Influences Drug Seeking Behavior in Mice

Neurobiological techniques may lead to better understanding behind opioid drug-seeking behavior currently plaguing the United States. This research aims to understand how different stressors impact opioid drug-seeking behavior in mice. A pilot study to engender fentanyl self-administration following stress was started and if successful, neurobiological examination will follow. Two cohorts of mice male and female were trained to differentiate between a Fentanyl containing solution and a counterbalanced solution. Mice were stressed through an ES/IS shock paradigm, then tested for the quantity of drug self-administered. Current results suggest that IS shock leads to an increase in drug self-administration in male mice, while female mice exposed to the ES/IS shock paradigm show less conclusive results. More cohorts are being ran to replicate current results and show conclusive behavioral results. This behavioral paradigm could help our understanding of the specific cell types/circuits that lead to stress-induced drug-seeking behavior.

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Communication Sciences and Disorders

Opioid Use Disorder (OUD) Risk-genes Across Cortical Developmental Periods

Opioid Use Disorder (OUD) is a current epidemic resulting in 69.5% of overdose deaths in 2018 in the United States. Opioids are commonly used for treating pain symptoms, but there may be severe implications with long term exposure (Center for Disease Control and Prevention,2020). This study

aimed to examine the relationship between OUD risk-gene patterns of expression within areas of the brain commonly linked to addiction behaviors over developmental periods. A literature review was completed to curate a list of 16 strongly supported OUD risk-gene. Next, RNA-sequencing gene expression data for 40 donors ranging from infancy to adulthood was obtain from the BRAINSPAN: Atlas of the Developing Human Brain. A correlation analysis was completed to examine the relationship between gene expression in regions of interest and overall age. It was hypothesized that OUD risk-genes during the late adolescent years would have higher expression within the regions of the brain classically connected to addiction. Preliminary results revealed a significant negative correlation between age and gene expression in the AMY for OPRM1 and a significant positive correlation for OPRD1 with in the OFC. OUD risk-gene expression patterns within the Striatum (STR), Amygdala (AMY), Hippocampus (HIPP), Orbitofrontal Cortex (OFC), and the Medial Frontal Cortex (MFC) over developmental periods is a crucial relationship to examine in order to understand more about the epidemiology, prevention, and long term treatment for OUD.

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Red Light at Night: Identifying Unexpected Sources of Circadian Disruption

Laboratory rats and mice are a valuable model used in all aspects of mammalian biomedical research. Researchers perform most rodent research during daylight hours and laboratory rodents are nocturnal, so exposing animals to light during their inactive phase will disrupt their circadian system and potentially confound the experimental results. The solution is to test lab rats and mice during their active phase under red-light conditions. However, recent studies in the Spencer laboratory have shown that the rat's circadian system also responds to red wavelengths of light. In situ hybridization for c-Fos mRNA and Per 1 was performed to observe expression in SCN and SPZ following red light exposure. Preliminary results strongly suggest a functional effect of even short durations of nighttime red-light exposure causes circadian disruptions.

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Biology

Differences in Plant Soil Feedbacks with Respect to Slope Aspect

Plants alter the biotic and abiotic characteristics of the soil they grow in, which can alter future plant survival, through a process known as plant-soil feedbacks (PSFs). PSFs play a key role in plant succession and invasion by nonnative species. Scientists are only beginning to understand how microclimate might affect plant soil feedbacks. In the semiarid Palouse Prairie Ecoregion of the Inland Northwestern US, aspect can affect microclimate, with harsher conditions on south facing slopes. Aspect also is related to plant invasion in this ecosystem, with increased invasion on south facing slopes. My objective was to determine if the effects of aspect on invasive species are mediated by plant soil feedbacks. To test this, I conducted a greenhouse experiment using two

native and two invasive prairie species, inoculated with soils collected from north and south facing slopes on Palouse Prairie remnants. Each pot consisted of autoclaved soil from an old agricultural field. The control group consisted of only the autoclaved soil, whereas the slope treatment pots consisted of 20% living soil. There were10 replicates per treatment. Germination and plant growth were measured after five weeks. I found that native species had higher growth rates when inoculated with soil from north slopes while invasive species growth rate was not affected. However, invasive species had much higher germination rates when inoculated with soil from south slopes. These findings suggest that slope aspect influences PSFs and these relationships can help with invasive species management in endangered ecosystems such as the Palouse Prairie Ecoregion.

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Astrophysics

Using Smartphone Sensors for Virtual Labs During COVID-19 Era

With the spread of COVID-19 around the world, students and faculty were forced to move to virtual learning. This especially impacted “hands-on” laboratory science courses. By using sensors embedded into smartphones, our team designed experiments for first year college students that could be done from their homes or dorms with their smartphones to teach physics concepts virtually. Specifically, we developed a set of activities to help students explore acceleration due to gravity using an accelerometer, by dropping their phones and by turning their smartphones into pendulums. An analysis was done on the students’ understanding of how a pendulum can be used to calculate g before and after they were asked to carry out the experiment in order to test the effectiveness of the lab. They were asked to think about any differences between their results for g from individual trials and from the two different methods to explore errors and uncertainties that arise when conducting experiments. Students conducted experiments independently and as part of small groups to help each other with any technical issues or physics understanding, compare results and have an expanded set of data. They were able to get a sense of the concept of simple harmonic motion through the use of these experiments, and the subtle differences in experiment trials that lead to uncertainties.

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Biology

Impact of Heavy Metals on Growth and Mortality in a Freshwater Bivalve (Epioblasma brevidens)

Contamination to the Earth’s freshwater aquatic ecosystem is a danger not just to humans but to all living creatures on our planet. Unfortunately, it is the areas that are the most diverse that are the most susceptible. The Southern Appalachians harbors one of the most biodiverse freshwater aquatic ecosystems in the world. The Southern Appalachians was affected by a blight on the freshwater mussel population. Freshwater mussels work in the environment by acting as a filtration

system. Contaminates can impact the species organs and soft tissues. The Clinch river was subjected to a contamination spill impacting its diverse aquatic species. Cumberland Combshell (Epioblasma brevidens) is a critically endangered species with little no to understanding on its population which declines despite conservational efforts. Sediment will be collected from the Clinch River, around the spill site, via sediment traps. Using juveniles (Cumberland Combshell), we will observe the changes in growth rate, biomass, and glycogen output. Growth rate and biomass will help determine if there is a change in overall survivability. Glycogen analysis will be used to see how well the individual uses and stores carbohydrates. We expect to see a decrease in survivability, growth rate, biomass, and glycogen in individuals exposed to sediments closest to the spill location. Individuals farthest from the spill site will likely have adverse effects but at a lower rate due to contamination being carried downstream.

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Anthropology & Psychology

Mediums of Influence: Imagery and Visualizations of Immigration in Popular Media in the US

This study aims to increase our understanding of the way media plays a role in shaping public opinion about immigration. This project focuses on the content gathered regarding processes associated with the production of information about migration and migration policies. In particular, it examines how the information produced is being consumed, how this plays a role in shaping societal perceptions of immigration, and ultimately how this all affects the political and legal shifts surrounding immigration. The Trump administration has significantly impacted the humanitarian protections of migration policies and did not hesitate to take advantage of the COVID-19 pandemic of 2020 as a scapegoat to facilitate the enactment of policies that allowed for more conservative immigration reform. (Pierce and Bolter 2020.) This global pandemic hits the United States at a time when likewise, the nation is facing a pandemic of racism and police brutality (Mbembe 2020.) In the United States especially, highlighted by the backdrop of these pandemics, media plays a critical role in shaping public opinion about immigration (Schemer 2012, Gonzales 2019, Strom 2017.) Expansion in use of virtual settings and increase in public discourse has pushed activism and counter narratives in the area of immigration policy and its impacts among undocumented immigrants (Chen, Lerman, and Ferrara 2020, Milan and Treré 2020.)

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Psychology

Traumatic Experiences and Mental Health Among College students

Because most college students have experienced one or more traumatic experiences before reaching college, they may be at increased risk of experiencing a mental health disorder, such as depression, anxiety or post-traumatic stress disorder (PTSD). The current study examined the relationship between a history of traumatic events and mental health disorders among college students. There were direct correlations between traumatic experiences and symptoms of anxiety,

depression, and PTSD. In addition, after dividing respondents into “low,” “middle,” and “high” levels of trauma, the high group scored significantly higher on symptoms of anxiety, depression, and PTSD. Women reported more symptoms of anxiety and depression and more physical/sexual trauma than men did. Some of these effects were moderated by ethnicity. These results support the findings of previous research, and suggest that there is a need for more research to determine the kinds of support and treatment needed for college students who may have experienced trauma.

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Biology

Sugar, Spice, and Everything (Not) Nice: The Effects of Red Pepper on Resting Energy Expenditure and Macromolecule Oxidation

Capsaicin is the chemical component found in chili peppers; previous literature has shown it to increase energy expenditure and can aid in weight loss. Therefore, the purpose of this study is to examine the effects that red pepper (RP) has on Resting Energy Expenditure (REE) and the Respiratory Quotient (RQ). Fourteen people in their late teens and early twenties participated in this study (mean ± SD; 76.15 ± 13.84 kg, 173.35 ± 10.27 cm, 20.14 ± 1.56 yr). Participants attended two sessions on different days where their REE and RQ were measured with a metabolic cart. A mixture of water and dextrose (D) (1 g/kg body weight) or water, D, and RP (.1 g/kg body weight) was given to the participant after 5 minutes of breathing normally. Half received the sugar water during the first session and the other half received the sugar water with RP. For 45 minutes following the administration of the drink, participants continued to breathe normally into the metabolic cart. Paired samples t-tests indicated that there was no difference in total test time RQ between the control and experimental sessions (D = .87 ± .04, RP = .86 ± .05, p = .556). In addition, there was no difference in total test time REE between the two conditions (D = 1809.51 ± 338.0 kcal, RP = 1912.50 ± 319.32 kcal, p = .187). These results suggest that the addition of RP to one’s diet may not have a significant effect in increasing REE and lower RQ.

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Archaeology/GIS

Understanding the Historical Past of Fort Spokane through Landscape Archaeology

This project will look at the historical past of Fort Spokane in an attempt to understand the archaeological and geographical significance of the Forts construction. Previous archaeological projects at this location have focused more so on the Fort itself, rather than the Fort and its surrounding environs. This project hopes to close that gap by looking at a wider scope. The project will use a combination of Landscape Archaeology as our methodology of choice as well as GIS (Geographic Information System) analysis using digital models and viewsheds. The viewsheds will help us determine the geographical advantages, if any the Fort has to its surrounding areas. It was built near two Native American reservations and possesses a long history with these tribes

spanning over 50 years (Riser and DePuydt 2012). The results of these viewsheds brought up some interesting findings, including that the Fort is in fact not able to see as much of the surrounding landscape as we originally thought. We have concluded that Fort was built not for its geographic location, but more so for its convenience along the river and being near two Native American reservations. In future projects, we hope to look at the artifactual remains of the Fort as well as explore other avenues of possibilities to build a bigger picture of the Fort and its historical past.

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Psychology

The Effects of the Aftermath of Immigration Enforcement on Supporters of Victims of an Immigration Raid: A Case Study of Paris, TX

This research will document the experiences of supporters of victims affected by an Immigration and Customs Enforcement (ICE) immigration worksite enforcement operation in the city of Paris, Texas. Research focuses on the supporters' challenges, and what they learned, as they tried to help their community cope with the multiple effects of a raid. The research draws from psychological perspectives of trauma and critical race psychology as well as from anthropological perspectives about the threat of deportability and accompañamiento/accompaniment. The research methods includes community participatory methods relying on individual interviews with supporters and on psychological assessments of trauma. This research contributes to a developing literature in the social sciences about the effects of ICE raids by focusing on teachers and their role as mediators of the effects of worksite enforcement.

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Physics and Mathematics

Tumor Displacement Prediction from Intraoperative Magnetic Resonance Imaging Using Viscoelastic Finite Element Biomechanical Modeling

Preoperative imaging is imperative to treatment planning for brain tumor patients however, tumor resection can lead to intraoperative brain deformation (a phenomenon known as brain shift). The deformation of the brain's structure due to tumor resection can compromise the accuracy of residual tumor and vital structure localization. As a result, intraoperative images are often needed to relocate the position of the residual tumor and the patient's brain structures. In order to decrease the need for intraoperative scans, we propose that using viscoelastic finite element modeling to predict brain shift and tumor displacement can be used to improve the accuracy of preoperative imaging. In this study, we analyzed the accuracy of patient-specific finite element models (FEM) generated from MRI scans of brain tumor patients who underwent partial tumor resections. Our results suggest that viscoelastic finite element modeling may be an improvement compared to current rigid registration techniques. Future work will include expanding this study to 10 patients and investigating the accuracy of FEM under more complex scenarios (such as

CSF partial drainage and using a poroelastic brain model). The ability to predict intraoperative brain deformation has the potential to significantly improve surgical accuracy, which could lead to decreased patient morbidity and faster recovery.

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Anthropology

Reclaiming Indigenous Space Through Protest Art: The 1969-1971 Native American Occupation of Alcatraz Island

This project examines the paintings from the 1969-1971 Native American occupation of Alcatraz Island in San Francisco, California. The Native American occupation of Alcatraz was a historically significant protest to bring attention to the injustices that Native peoples face. The occupiers left behind over two hundred graffiti-style paintings of political slogans and personal messages. These paintings serve as a form of aesthetic resistance and as a visual diary of the occupiers' experiences during a historic event. Through both a literature review and archival research, this research examines the historic value and conditions of the paintings along with the preservation and restoration efforts from the National Park Service. This project argues that the artwork from the occupation should be considered historical paintings, and more efforts should be made to preserve and restore them. Additionally, this project discusses the outdated and disarrayed archived documentation of the occupation. This research also explores the lack of Native American history and the derogatory language used in Alcatraz's nomination to the National Register of Historic Places. Ultimately, preserving the paintings from occupation means preserving Native American history, which is paramount to the alleviation of intergenerational trauma that Native Americans experience. Preserving and restoring the paintings that are still left on the island would allow for healing within Native American communities, and it would also create a space of public memory that future generations can honor and learn from.

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Epidemiology and Public Health

Analysis of Lamar University NCAA Student Athletes and Non-Student Athlete Differences in Health, Health Behavior and Healthcare Utilization During Global Pandemic

The university system, widely known for its attributions in opportunities towards economic mobility has continued to expand resources, namely healthcare access for many student athletes. The National Collegiate Athletic Association (NCAA) is undergoing a number of disputes regarding reforms of student athlete welfare beyond collegiate program completion. Studies have not yet focused on the NCAA student athlete population at Lamar University. As of March 2020, Lamar University alerted both students and faculty on the behalf of the outbreak of SARS-CoV-2 to also follow Centers for Disease Control and Prevention protocol. Based on these parameters, this study examined health markers of students who were enrolled between Fall 2019-Fall 2020. Differences

between the general student body and student athletes were compared to distinguish variances amongst health, health behaviors and health care utilization. Participants submitted a self-report questionnaire on health insurance and employment status, academic standing, alcohol and substance abuse, prevalence of sport and/or non-sport related injuries, and demographics. The primary objective is to analyze differences between NCAA student athletes and the general student population of Lamar University. The NCAA student athletes, or LU Athletic Department, will then be further assessed in terms of their (a) rookie and veteran athletes and (b) between all NCAA student athletes and other non-NCAA student athlete participants.

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Biology

Oviposition and Olfactometer-Based Behavioral Responses in Ae. aegypti Mosquitoes

Oviposition assays are used to study the process of laying eggs. Female oviposition has been thoroughly studied in scientific literature, however there are still a plethora of unanswered questions in this field. By studying the volatile odors that attract oviposition in female mosquitoes, better trapping and surveillance methods can be developed to prevent the further spreading of neglected tropical diseases and to encourage public health initiatives. The three main volatile odors studied were beet root extract, oak leaf infusion, and geosmin while deionized water served as the control. Geosmin is an organic compound that is developed in aquatic and soil-dwelling bacteria that contributes to the "earthy" odor after rainfall. Beet roots contain geosmin, but oak leaves do not; however, both volatile odors contain several other compounds that combine to attract mosquitoes. In the study, we expect that the number of eggs oviposited by female Aedes aegypti mosquitoes will be significantly higher with beet root extract than with geosmin, water-only, and oak leaf infusion in the laboratory setting. In addition to oviposition, olfactometer-based behavioral assays were conducted using the same volatile odors to test host-seeking in female mosquitoes. Olfactometry is a standardized technique that utilizes a dilution instrument known as an olfactometer. By better understanding host and oviposition preference the female mosquito's sensory biology can be further studied and the neuronal responses and molecular basis of host preference can be identified in order to develop better preventative techniques and vector control.

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Electrical Engineering

3D Glass-based RF filters for 5G Communication Systems

With the introduction of 5G and IoT devices, there is an expected rise of wireless applications allocated in closely-spaced frequency bands. RF filters ensure these frequencies do not interfere with other devices by attenuating unwanted frequencies and passing through only desired ones; however, realistic applications require that these filters be miniaturized to fit in a device. This project focused on the design of such high-quality RF filters with 3D glass in multiple bands for the sub-6 GHz frequency spectrum. The design begins with ideal, lumped-element filter techniques

and replaces the elements with glass components to achieve the same effect while producing a realistically small footprint. In future research, these designs may be fabricated and tested in a lab to investigate any performance deficiencies with this method.

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Psychology

Can children learn verbs even when irrelevant events are present?

In laboratory studies of children's verb learning, children are often asked to deduce the meaning of a new verb by observing events (e.g., Haryu et al., 2011; Childers et al., 2019). However, usually, only relevant events are shown in the lab while in everyday life, events relevant to one verb are often interspersed with events linked to other verbs (Medina et al., 2011). In this study, we present children with sets of dynamic events and ask whether they can adjust their visual attention to events as they discover which events are irrelevant. Additionally, we ask whether they can extend verbs to new events at test. Two _- (n=19), 3 _- (n= 27) and 4 _-year-olds (n=21) were shown 3 dynamic relevant (target) events (repeated across trials) and 2 irrelevant (distractor) events (varied across trials) in three different orders: Distractor first (DTTDT), Target first (TTDDT) or Alternating (TDTDT). This summer, we were able to draw new Areas of Interest (AOIs) in each of these learning trials, adding an AOI for the head of the agent and an AOI for the hand region of the agent. Thus, the project now includes new DVS: total fixation duration (or dwell time) to the head region and hand region, and proportion correct when pointing during the test (= total correct/total responses).An RM ANOVA was computed with Trial type (target, distractor), AOI type (head, hands), Trial number (first, last) as within-subjects factors, Age group (2s, 3s, 4s), and Order (DTTDT, TDTDT, TTDDT) as between-subjects factors. This yielded three 3-way interactions. Thus, we split the data by Order and found that children looked significantly longer at the hands region versus the head region, but this was especially pronounced for the Target events. In terms of pointing at test, a Univariate ANOVA showed that there was a main effect of age, with 3s and 4s able to extend the new verbs. The study shows that children attend more to the hands than the head, especially when seeing target events linked to a new verb. This is an exciting finding, showing adjustment of visual attention based on whether events are relevant or not. Also, children can extend new verbs by 3 1/2 years. These emerging findings are important as verb researchers seek to account for verb learning in more naturalistic contexts in which learners hear verbs over multiple contexts, with intervening irrelevant events or verbs.

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Biology

Asian Tiger Insecticide Resistance and Arboviral Surveillance in Oklahoma

Mosquito-borne diseases have affected millions of people each year causing severe illnesses and death in many cases. Knowledge and surveillance of arbovirus spread and increasing insecticide

resistance among mosquitoes is essential in aiding control efforts and conserving public health. Our project was a collaboration with the NASA Globe Observer program which allows citizen scientists to collect and record data using the Globe observer mobile application to efficiently monitor for the presence of medically important vectors around the globe. We specifically focused on screening laboratory-reared larvae from wild-caught Aedes albopictus mosquitoes from several counties around Oklahoma collected during the 2019 NASA GO OK! project. Aedes albopictus are common vectors of mosquito-borne flaviviruses such as West Nile virus, Zika, and Dengue fever and pose an important threat to global health. Individual mosquitoes were characterized for two alleles in the sodium channel (kdr) gene associated with pyrethroid resistance. Allele-specific primers were used in real time-quantitative polymerase chain reactions (RT-qPCR) to genotype the 1534 phenylalanine to cysteine single nucleotide polymorphism (SNP) associated with insecticide resistance using a melting curve analysis. Additionally, mosquitoes were screened for arboviruses with primers targeting the conserved NS5 region flaviviruses. After analyzing the DNA and RNA of 69 Aedes albopictus mosquitoes, our data suggest that Aedes albopictus in the Oklahoma metropolitan area are susceptible to insecticides and could become vectors of flaviviruses through blood-feeding on animals and humans infected with a flavivirus. These results highlight the growing importance of arboviral surveillance and control efforts to conserve and enhance public health.

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Electrical Engineering

Towards the Scaling Up of Perovskite Solar Cells: Perovskite Photovoltaic Module Modeling and Optimization

Perovskite solar cells (PSCs) are one of the most researched photovoltaic technologies in recent years because they are thin film materials and can be solution processed, which means they can be produced easily and quickly, much like printing newspaper. This suggests the potential of being low cost. In addition, PSCs have achieved high efficiency in relatively short years. However, the highest efficiencies are only achieved with small solar cells, and before commercializing this technology, the solar cells must be scaled up to solar modules without losing efficiency. When solar cells are scaled up into modules, efficiency drops significantly, due to various factors such as resistive losses. This project provides insights found by modeling perovskite photovoltaic panel performance as a function of material, device, and circuit parameters. Using the scientific programming environment Python, equations that relates energy produced, resistance, and width, can be solved. After solving for device parameters and these equations, full sized panels can be simulated.

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Psychology

Congregational Support Moderating Schizotypy's Relationship Between Spiritual Experiences, Paranormal Beliefs, and Conspiracy Beliefs

This study will examine schizotypy in relation to spiritual experiences, paranormal beliefs, and conspiracy beliefs; with congregational support acting to moderate the relationship. Schizotypy refers to traits or symptoms that resemble schizophrenia, but in a diminished form, and high scores are thought to represent a risk for the development of schizophrenia spectrum disorders. The sample will come from archived data and will enable the researchers to determine associations between schizotypy and spiritual experience, paranormal beliefs, conspiracy beliefs, with and without congregational support being included. Although topics relating to spirituality, paranormal, and conspiratorial beliefs have great variations of expression depending on the individual and culture, there tends to be a positive correlation between schizotypy and spiritual experience, paranormal beliefs, and conspiracy beliefs. At the same time, research tends to show that social support leads to an increase in well-being, so the presence of social activity in such environments might lead to more adaptive traits, such as low schizotypy. We expect to find that congregational support moderates the relationship between schizotypy and spiritual experience, but not the relationship between schizotypy and paranormal beliefs and conspiracy beliefs. This research was chosen because the results could aid in understanding what factors relating to the research contribute to improved well-being and what facets of these variables may inhibit improvement in the selected sample. Upon completing the study, the results may present differences between varying factors that can help determine which combination of factors lead to high schizotypy scores.

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Biochemistry

Designing Affordable and Efficient Dye-Sensitized Solar Cells Using Natural Pigment Extracted from Plants

Dye-sensitized solar cells are thin-film solar cells that utilize semiconductors formed between a photosensitized anode and an electrode. This research aims to find effective techniques to design efficient and affordable dye-sensitized solar cells using organic molecules extracted from natural pigments. Mixtures of different organic molecules found in various plants were collected and dissolved in four different solvents - water, methanol, ethanol, and acetone. The plants used in this research are blackberries, blueberries, red beetroot, red cabbage, spinach, and turmeric. The natural pigments found in these plants are excellent light-harvesting pigments that can generate charge carriers for the electric current production. The absorbance and transmittance at each wavelength and wavenumbers were measured using three different spectroscopic methods by exciting the electrons in these organic molecules at different wavelengths. Data plots were made to relate the wavelength to absorbance in absorption spectroscopy, the wavelength to intensity in

fluorescence spectroscopy, and wavenumber to the percent transmittance in FTIR spectroscopy. After a successful construction of the solar cells, the open-circuit voltage (Voc) and short-circuit current density (Isc) data were plotted to find the highest photoelectric efficiency (_).

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"Whether or not you reach your goals in life depends entirely on how well you prepare for them and how badly you want them. Before you can make a dream come true, you must first have one."

-Dr. Ronald E. McNair

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