

MCNAIR RESEARCH CONFERENCE

AUGUST 3-4, 2023

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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. As a nationally ranked Research 1 institution, Baylor University aspires to transform lives around the world through groundbreaking 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 is part of the Paul L. Foster Success Center at Baylor University, and seeks to provide Baylor undergraduate students with a truly transformational education through undergraduate research, access and opportunities. The program aims to prepare undergraduate students specifically from low-income, first-generation and underrepresented backgrounds to acquire the knowledge and skills necessary to successfully complete a PhD program after they graduate from Baylor. I encourage all undergraduate attendees to consider Baylor University for their graduate studies.

This year's Baylor McNair Scholars Research Conference comprises outstanding speakers, workshops, panelists and student presenters from a multiplicity of disciplines. More than 40 universities from across the country will be represented, making this a remarkable and comprehensive experience for all participants. 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, AUGUST 3

TIME	EVENT
8:00 - 9:00 am	Registration/Breakfast *
9:00 - 9:45 am	Welcome & Keynote
10:00 - 11:00 am	Oral Presentation Session 1
11:15 am - 12:15 pm	Oral Presentation Session 2
12:30 - 1:30 pm	Lunch with Baylor Baylor Graduate Program Director Panel Featuring Baylor McNair Fellowship Information
1:45 - 2:45 pm	Oral Presentation Session 3
3:00 - 4:00 pm	Oral Presentation Session 4
4:15 - 5:15 pm	Graduate School Tour and Social Event
6:30 - 9:30pm	Dinner and Networking Mixer — Topgolf Waco*

FRIDAY, AUGUST 4

TIME	EVENT
9:00 - 10:00 am	Networking Breakfast/Poster drop off*
10:15 am - 12:30 pm	Professional Development Workshop Sessions
12:30 - 2:00 pm	Lunch Provided On-Campus
2:00 - 5:00 pm	Poster Presentation Session & Graduate School Fair*
7:00 - 9:00 pm	McNair Closing Gala Dinner* (Business/Semi-Formal attire)

* Bus transportation will be provided to and from the conference hotels and pick up times listed in the travel section of our website.

KEYNOTE SPEAKERS



Dr. Stephen Reid

*Vice Provost for Faculty Diversity and Belonging
Baylor University*

Dr. Stephen Breck Reid was appointed Vice Provost for Faculty Diversity and Belonging in the fall of 2022. Along with his appointment as Vice Provost, Dr. Reid is a Professor of Christian Scriptures at the George W. Truett Seminary. He is a member of the Society of Biblical Literature and the Catholic Biblical Association. He has served in ministerial roles in Baptist, the Church of the Brethren, Mennonite, and Presbyterian congregations.



Kristina Campos-Davis

*Chief of Staff to the Provost
Baylor University*

Dr. Kristina Campos-Davis is a leader in the intersections of public relations, communication, and higher education. She has been in the industry for over 20 years, first as a professor of communication & sociology for more than 18 years and then as a PR and communications leader on the administrative side. Early in her career, Kristina was also an anchor and reporter at a local CBS station.

In 2018, she made the transition to college administration, working in public relations and communications before taking on her current role as chief of staff to the provost at Baylor University.

She received her Bachelor's in Political Science and Master's in Communication from Abilene Christian University and her Ph.D. from Texas A&M University in Rhetoric & Public Affairs. A lifelong learner, Kristina continues to seek further

education, receiving her MBA in Management and Finance in August 2021.

When she is not working, she is actively involved in her community, serving on the boards of organizations like the Junior League of Abilene, the Abilene Philharmonic, Big Brothers Big Sisters of the Big Country, Friends of the Abilene Public Library, Friends of the Waco Public Library, the Office of Neighborhood Services, Day Nursery of Abilene and the Heart of Texas Goodwill Industries.

Kristina's husband, Den, owns his own business, and they have a daughter, Téa, who is in college.

WORKSHOP SPEAKERS



Wren Aye

*Outreach Coordinator
National Science Foundation – Operations Center*

Presentation Title:

Applying for the NSF Graduate Research Fellowship



Jennifer K. Hunter

*Assistant Dean
Rice University*

Presentation Title:

Telling Your Personal Story Through the Grad School Application Materials

As an Assistant Dean in the Office of Graduate and Postdoctoral Studies, Jennifer promotes Rice University as a fantastic place for graduate study. She helps graduate students develop to their full potential by coordinating and offering opportunities designed to supplement the graduate programs themselves. She also is proud to work with the Fulbright@Rice and Graduate Student Ambassador Groups.

Jennifer has worked in higher education since 2005. She has a bachelor's degree in Public Relations from the University of Florida and a Master of Science in Library and Information Studies from Florida State University.

She loves to travel, and wherever you live in the world, she probably wants to go there next. She hopes to visit all seven continents one day - six down, one to go.



Dana Mordecai

*Assistant Director for Graduate Recruitment
University of North Texas*

Presentation Title:

Finding the Right Program: It's more than a Google search

Dana Mordecai is the Assistant Director for Graduate Recruitment at the University of North Texas. For the past 17 years, she has served in recruitment, advancement, student services and admissions roles in the Toulouse Graduate School and now Office of Graduate Admissions, serving over 12,000 graduate students in 132 graduate programs. As an ambassador and graduate of UNT, she works with every level in the university on targeted recruitment activities and developing marketing and communications for prospective graduate students. Dana works across silos as a critical path to support students through the graduate application process at UNT and beyond.



David Shafer

*Assistant Dean
North Carolina State University*

Presentation Title:

Making Yourself Competitive for Grad School

Dr. David Shafer is Assistant Dean of the Graduate School at North Carolina State University. He is responsible for oversight of fellowship and award programs, graduate recruitment initiatives, and diversity-focused programs. Annually, he oversees federal, state, and privately funded fellowship and traineeship programs valued at over \$6 million. He served as the NC State University Principal Investigator of the NSF AGEF program, entitled the North Carolina Alliance to Create Opportunity Through Education (2005-2011), and was one of the PI's of NC State's NIH-funded Initiative for Maximizing Student Diversity (2008-2017). Dr. Shafer began working with The Graduate School at NC State in 1990 after receiving his B.A. in political science at the University of North Carolina at Chapel Hill. Prior to his appointment as Assistant Dean in 2003, he served as Coordinator of the Colloquium on Issues in Graduate Education and Director of Fellowship Programs. Dr. Shafer earned both a master's degree in political science (1993) and Ph.D. in public administration (2002) from North Carolina State University.

BAYLOR GRADUATE PROGRAM DIRECTOR AND FACULTY PANEL



Dr. Joaquin Lugo
*Associate Professor of
Psychology and Neuroscience
and Graduate Program Director,
Ph.D. Program
Behavioral/Cellular
Neuroscience
(former McNair Faculty Mentor)*



Dr. Christie Sayes
*Associate Professor of
Environmental Science
(McNair Faculty Mentor)*



Dr. Michael Trakselis
*Professor of Biochemistry,
Director of Graduate
Affairs, Department of
Chemistry & Biochemistry*

ORAL ABSTRACT PRESENTATIONS

(In alphabetical order as submitted)

Aaliyah Gutierrez-Cano, agutie42@stedwards.edu

St. Edward's University, with Dr. Claire Edwards

Biology

Producing Ethanol Tolerant Mutants of *Saccharomyces cerevisiae* 09-448 using a UV Mutagenesis Protocol

The collapse of numerous ecosystems as a result of climate change prompts society to stop using fossil fuels as an energy source and, instead, use alternative fuels, like biofuels that are made from the fermentation of biomass, such as pectin-rich biomass. Although the fermentation of pectin-rich biomass is costly, the overall process can be made more inexpensive with the use of *Saccharomyces cerevisiae* 09-448, a yeast strain that produces its own pectinase and obviates the need for some commercial enzymes that are used to catalyze the breakdown of polysaccharides found in the cell wall of pectin-rich biomass into monosaccharides for yeast to ferment. However, 09-448 cannot yet be used industrially because it cannot withstand common industrial stressors, such as increased ethanol concentration, temperature, osmotic pressures, and changing pH conditions. To produce an ethanol-resistant mutant capable of surviving under fermentation conditions, 09-448 was exposed to UV radiation for up to three minutes. Potential mutants were then screened for ethanol resistance by measuring their growth with a plate reader in ethanol concentrations up to 6%. Of all 12 mutants that were screened, eight performed better than 09-448 at both 4% and 6% ethanol concentrations. Mutant 12 seemed the most promising with a final OD of 1.15 au and a minimum generation time of 65 minutes compared to the wild type with a final OD of 0.633 au and a minimum generation time of 70 minutes when grown at an ethanol concentration of 6%.

Alejandra Garcia, agarcia23@nevada.unr.edu

University of Nevada, Reno, with Dr. Mae Gustin & Dr. Heather Haines

Environmental Science

The effect of drought on records of atmospheric mercury: Analyzing tree rings through industrialization to present day

Human activities related to industrialization have increased atmospheric pollutants. One such pollutant is mercury (Hg), which has proven to have severe detrimental impacts on natural ecosystems. The exact amount by which atmospheric mercury concentrations have increased over time are poorly understood; therefore, this project aims to develop a high-resolution record of atmospheric mercury using tree rings since 1850. Here tree rings from Giant Sequoia trees located along the USA western coast serve as an annual archive of atmospheric mercury. Trees take up mercury from the air via the stomata, and mercury is transported to tree rings via the phloem, generating an annual record of atmospheric mercury concentrations through time. In addition, during drought stomata on the needles close and change the ratio of Carbon-13: Carbon-12 isotopes. By analyzing the carbon isotope ratios and mercury in

annual sequoia tree rings, we can understand how drought has influenced tree atmospheric Hg uptake. These results will inform our understanding of how drought events affect mercury uptake within tree rings, and by extension the impact of climate on the historical record of mercury found in the rings. Additionally, these results will provide insight on how both natural and anthropogenic activities affect mercury in the environment allowing for better management of potential causes of damage to natural ecosystems.

Alexa Degado, aadelgado19fl@ollusa.edu

*Our Lady of the Lake University, with Dr. Briana Salas
Biology*

Microbiologically Induced Corrosion of Marine Vessels and Structures

Although manufacturers utilize copper to construct marine vessels and structures because of its antimicrobial properties, these structures continue to corrode costing manufacturers money and valuable resources. Researchers have identified evidence of microbiological corrosion. The Microbiologically Induced Corrosion Research Project, or M.I.C., will be utilized to identify active microflora present when metals corrode in various water samples. This study will utilize Copper-Nickel (CuNi) coupons as the experimental group and titanium (Ti) coupons as a control. Coupons are a specimen of metal, in this case, CuNi coupons and Ti coupons, cut into a strip or ring shape. For this experiment, they will be cut into a rectangular shape. There will be two groups of coupons: a field group and a microcosm group. The metal coupons in the field will then be incubated for 9-14 months, and the microcosm group will be incubated for 16-20 weeks. The field coupons will be collected every month after the first month of incubation, and the microcosm coupons will be collected every two weeks after the first two weeks of incubation. We will collect the layer of biofilm that has direct contact with the metal coupons and through culture-based analysis, we will isolate and amplify the DNA of present microorganisms from our samples to identify functional CuNi-resistant genes. This will aid in constructing and maintaining metal ships, pipelines, oil rigs, and other metal structures meant to inhabit water.

Angelique Luna, aeluna20sp@ollusa.edu

*Our Lady of the Lake University, with Dr. Emily Sauers
Kinesiology*

Cardiometabolic Risk Factors in Hispanic College Aged Women

Cardiovascular diseases is the number two cause of death for Hispanics in the U.S. Cardiovascular disease are closely rated with high blood pressure, diabetes, hyperlipidemia and can increase your risk for heart disease and this is closely related to obesity. The CDC stated in 2017-2018, 44.8% of Hispanics met the criteria for obesity. Vella (2011) found a positive correlation between low physical activity and heart disease in young Hispanic women, only 30% of participants met the physical activity guidelines and had a reduced risk of heart disease, According to McEligot (2020) Hispanics have a higher obesity rate and higher body fat percentage compared to other populations, but this was due to stress rather than lack of physical activity. Current Literatures is unclear regarding, correlation between Hispanic women between the ages of 18-24 and cardiometabolic risk factors. I will be conducting quantitative and descriptive research, investigating Hispanic women between the ages of 18-24, I will measure their blood for lipid count, glucose levels and collecting their body mass index, body composition, resting heart rate, resting blood pressure and fitness measurements over a two-day testing period. Day one will be collecting preliminary measurements, anthropometrics

following a 12-hour fasting period. Day two will take place 24-48 hours after day one and will include cardiorespiratory and muscular fitness testing. The research will help increase the literature to better understand the relative risk of cardiometabolic risk factors in Hispanic women between the ages of 18-24.

Anyla Shipman, JShipman@forum.montevallo.edu

University of Montevallo, with Dr. Curtis Fennell

Exercise and Nutrition Science

The Effects of High Intensity Functional Training on a 1-repetition Maximum

A general warm-up (GWU) is usually performed before an individual participates in a resistance exercise one-repetition maximum (1-RM). However, there is a dearth in research as to which warm-ups fully optimize muscle potential. The aim of this study was to measure the effects of traditional (TRAD) versus a high-intensity functional training (HIFT) GWU on conventional barbell deadlift 1-RM, force, power, and muscular activity. Eleven healthy, resistance-trained men and two women participated in the study. Participants were randomly counterbalanced to complete the TRAD or HIFT GWU. The TRAD GWU consisted of cycling on a Monark cycle ergometer for 15 minutes at a heart rate range of 55–60% of the maximum heart rate. The HIFT GWU consisted of completing as many rounds and reps as possible in 15 minutes of 250-meter/200-meter row for men and women, respectively on the Concept 2 rowing ergometer, 5 burpees, 10 kettlebell swings (53-pound and 35-pound for males and females, respectively), and 15 air squats. There were no significant differences between TRAD and HIFT in 1-RM, force, power, velocity, or muscular activity (all $p > 0.05$). These preliminary results demonstrate that a bout of high-intensity functional training exercise preceding a 1-RM lift does not impair strength performance for the conventional barbell deadlift 1-RM. In addition, performing a bout of higher intensity exercise before heavy resistance exercise may be a useful modality order for those who do not engage in regular aerobic exercise, since there may be greater health benefits to engaging in higher intensities of activity.

Ashlynn Main, Ashlynn_Main1@baylor.edu

Baylor University, with Dr. Ashley Barrett

Communication

Compassionate Healthcare and Marginalized Patients

There has been a growing focus and need on the examination of compassionate communication in healthcare. Many marginalized patients have experienced uncompassionate care from physicians in healthcare visits. Under my mentor's project, we are examining how compassionate healthcare relates to serving marginalized and underserved populations. The research questions of the study is to discover how providers can better suit marginalized patients and in what way. Additionally, how is marginalized-patient care different from non-marginalized patient care? The focus of this project was to conduct a survey of the academic literature on the research areas of compassionate literature, marginalized healthcare populations, and how best to serve marginalized patients. The purpose of the literature review was to discover the extant, current literature on compassionate and marginalized healthcare populations, what methods have been implemented to help serve marginalized patients, and on compassion and organizational communication. Results from this review suggest that it is difficult to implement a more structured approach to compassionate communication in healthcare as it needs to be implemented by an organization. However, there are ways to ease this structural transition such as compassionate communication training or models that allow physicians to move towards a more compassionate

shift when communicating to marginalized patients in particular. The insights from this literature review can serve as a valuable resource to see the different methods being discussed for implementing compassionate communication in healthcare. Moreover, the insights from this review can be used in an initial research proposal.

Auldynn Chambers, auldynn_chambers1@baylor.edu

*Baylor University, with University of Michigan SROP, Dr. Joseph Potkay
Biomedical Engineering*

Designing, Processing, and Validating the Functionality of 3D Printed Artificial Placenta Drainage Cannulas

There are approximately 25,000 extremely low gestational age newborns (ELGANs) and 80,000 premature infants born each year that risk death and disability. The artificial placenta (AP) research project aims to help support ELGANS and preemies by recreating the fetal physiology through extracorporeal life support. In order to properly regulate the blood flow within the AP, drainage cannulas are needed. For this study, the 3D printing approach to manufacture was explored. Building off of previous models of cannulae, the current study involves an ovular cross-section as opposed to circular, proving to resolve recurring issues of cannulae splitting and collapse. It was found that this is mainly due to design and the print grain pattern. To collect data, cannulas were water and blood tested using a continuous flow pump, simulating the blood flow inside an ELGAN lamb. Currently, results show that the ovular geometry has reduced the occurrence of splitting and collapse due to negative pressures. This development is what ultimately led to the advancement of the project moving onwards to blood flow testing. With the current 3D printed 6fr cannulas, advancements have been made in the research of artificial placenta in developing a reliable form of manufacturing this device. The 3D printed approach also offers variety to better accommodate patient needs. Given this device is to be used in-vitro, it will need further testing and preparation for biocompatibility so they can be inserted into the body without risk of infection or other complications.

Azana Best, azana_best1@baylor.edu

*Baylor University, with Dr. Sarah Kienle
Biology*

Comparison of stable isotope analysis values of various leopard seal tissues

The rapidly changing climate is causing a shift in the ecosystem of the Southern Ocean . Leopard seals (*Hydrurga leptonyx*), are apex predators of the Southern Ocean that heavily control the structure of the Southern Ocean food web. Leopard seals are one of the least studied apex predators on Earth, due to their remote habitat, solitary nature, and aggressive behavior. Researchers opportunistically collect samples from leopard seals to study their diet (stable isotopes; bulk nitrogen and carbon), leading to a variety of different types of archived samples. However, the comparison of these tissues and how well they represent the individual's diet is unknown. Our objective is to compare the isotopic composition of each tissue to further inform us on leopard seal diet and similarities and differences between the tissues (whiskers, hair, blood, claws, blubber) from the same individuals. The isotopic measurement of several tissues from the same individual can provide short-, intermediate-, and long-term dietary information. Our preliminary data shows an association between two very distinct tissues, blood and whiskers. Additionally, we investigated the variation of nitrogen and carbon isotopes along the length of whiskers, providing important base-line information on the variance in isotope values from seals feeding on heterogenous diets. Our next steps are to analyze the isotopic composition

of the remaining tissues and assess the variation between the tissues based on their different turnover rates. These results will allow more accurate dietary reconstructions on the basis of isotopic analysis of the tissues of seals and other marine mammals.

Brangelitee Orozco Ayala, borozco@nevada.unr.edu
University of Nevada, Reno, with Dr. Matthew C. Leone
Criminal Justice

Examining the Relationship Between School Quality and Incarceration: The School-to-Prison Pipeline in Northern Nevada

Disparities in school quality and educational opportunities drive school failure, potentially making crime more likely and even necessary for survival (Pesta, 2018). These disparities, however, are not applied evenly across school districts. Urban schools with greater Black, Hispanic, and poor student populations are more likely to be disadvantaged relative to their suburban counterparts, which is related to punitive responses (rather than restorative responses) to student misbehavior (Ann Payne & Welch, 2010). While studies have shown that adult incarceration may result from structural racism in schools, (recognized as the school-to-prison pipeline), the relationship between school suspension in adolescence and later interactions with the criminal justice system remains poorly resolved (Novak, 2019). Further, the relationship between real and perceived disadvantage and dropping out has not been fully explored. This study will examine the perceptions and experiences of high school-aged residents in the Reno/Sparks area and compare them with the perceptions and experiences of inmates in the Washoe County Regional Detention Facility (WCRDF). The proposed study will employ two different data collection strategies. For the high school youth, data will be collected via snowball sampling wherein respondents will provide the QR code which leads to the Qualtrics survey to their friends. The inmates from the WCRDF will be interviewed via video and their responses will be recorded on paper and entered into the Qualtrics database. The data will be used to test the interconnections between school discipline and incarceration and to identify the impact of real and perceived disadvantages to school failure and ultimately the school-to-prison pipeline. A better understanding of this pipeline could result in policy changes and fewer incarcerations.

Brenda Valdes, brenda.valdes@my.utsa.edu
The University of Texas at San Antonio, with Dr. Jorge Solis
Psychology

Translanguaging in the classroom: Unveiling the power of multilingualism

Using a sociocultural lens, this paper examines the practice and use of second languages in pedagogy. Due to the increasing diversity in the world, we will look at multilingual learning education, more specifically translanguaging behaviors in pedagogy. Literature suggests that translanguaging is not just beneficial, but also fundamental for rich learning outcomes. As well as the sustainability of cultural identity. Although Dual Language (DL) has shown good results, English Learners (EL) are the less likely to graduate college and receive unequal instruction in areas of study in Science, Technology, Engineering and Mathematics (STEM). Literature propose that educators should not make the focus on language as a deficit but build on their funds of knowledge to make multilingual education an asset for learning and creativity. During this investigation, we observed video recordings of Texas students in dual classroom settings, Bilingual Teacher Candidates (BTC), and mentor Teachers. We also look at how the adaptation of this multilingual pedagogy, could leverage these inequalities in minority students in higher education, more specifically STEM disciplines.

We observed classroom instruction and interaction between students and teachers, transcribed these videos, and analyzed the instances in which students, and teachers, engaged in translanguaging behaviors. To analyze the discourse, we applied thematic analysis to identify patterns and themes. Based on the data, we identified three main themes: student reciprocity, recall of learned concepts, and group collaboration. Hence, this paper focused on the behavior of translanguaging in a real classroom setting, investigating when and how students use translanguaging.

Briana Smtih, smithbri@uw.edu

*University of Washington, with Dr. Karam Dana
Sociology*

Genesis to Revelation: The Creation and Dissemination of Cultural Values in Evangelical Congregations

The White Evangelical church has long had a powerful voice in the formation of both cultural and political values in the United States. However, American society is undergoing a transformation in the way marginalized populations and social movements are viewed, and that role is changing. In today's social climate, what is the role of Evangelical pastors in shaping their congregant's views towards marginalized populations and social movements, both politically and culturally? From what sources do those pastors draw their views and how are they disseminated among congregants? For this research, I explored the ways in which Evangelical Christianity in the United States affects the conversation around marginalized populations. I conducted content analysis of a representative selection of sermons, interviewed pastors regarding the ways in which they discuss this and why and how they acquire their knowledge and information about it, and engaged in ethnographic observation of different congregations during services. I expect to find connections between political affiliation and general stance on social issues which impact the types of teaching handed down to congregants, and that cultural lenses will impact the interpretation of scripture. I also expect that the voice of the pastor continues to hold strong influence over Americans who attend church, but that the methods used are changing to embrace new technology. In our increasingly polarized society, understanding the creation and dissemination of cultural values in churches gives us valuable insight into the politicization and radicalization of Americans into disparate and often conflicting groups.

Caleb Marrero, caleb.marrero@unh.edu

*University of New Hampshire, Dr. Trish Kelshaw
Health Sciences*

Epidemiology of Concussions Among Collision Sport Status in Middle School Athletes

The research regarding the epidemiology of concussions in U.S middle school athletes is limited and underrepresented. Prior research on high school and collegiate athletes suggests that those who participate in contact/collision sports are at a higher risk of concussions. However, the risk of concussions in middle school sports is not well understood. This study aims to compare concussion incidence (i.e., rates) among three groups of sports. Group definitions are consistent with NCAA classifications and defined as contact/collision, contact, and limited contact sports. It is important to compare concussion rates among these three categories of sports (i.e., limited contact, contact, and contact/collision) to bring more awareness of characterizing potential negative influences on the brain of these young athletes. Concussion data were collected by certified athletic trainers for all middle school-sponsored sports

events in a public-school division over six school years (2015-16 to 2021-22; excluding 2020-21 due to COVID-19). A retrospective descriptive epidemiological study will then be conducted on a large middle school epidemiological database. This study will examine concussion rates among middle school athletes (grades 6 to 8; 10-14 years old) across sixteen middle schools in Virginia and hope to conclude the difference between rates of limited contact, contact and contact/collision sports.

Camellia Valencia, Camellia_Valencia1@baylor.edu

Baylor University, with Dr. Julie Holcomb

Art History

The Decolonization of the African Collection from the Martin Museum of Art

This research project aims to study the provenance and ethical practices used during the creation of the Martin Museum's Permanent African Collection and connect their current practices to museums worldwide. The first part of the project focuses on the museum's creation, the formation of the African Collection, and its provenance. The second part of this project focuses on three objects from the Martin and addresses contemporary museum topics related to each piece. Issues discussed in this project's second half include colonization's impact on African art, tourist objects and their authenticity, and the decolonization of museum spaces. This research is important because museum ethics have evolved immensely since the 1970s when most of the African Collection was acquired. Furthermore, the Martin Museum and other institutions have begun addressing ethical issues arising from their permanent collections to decolonize their spaces. This project required a mix of archival research, library research, and research on museum policy. This study uncovers ethical problems from the past but also shows a positive change in institutional practices today. This project concludes by discussing what Martin Museums is doing to prevent ill practices in the future and how their reflections on past actions make them better institutions today.

Cameron Crowder, ccrowder@stedwards.edu

St. Edward's University, with Dr. Amy Concillio

Environmental Science and Policy

Effects of Biochar-Compost Product Blends on Switchgrass Growth Rates

Biochar, compost, and compost tea have become increasingly popular methods for promoting plant growth for agriculture and restoration projects in recent decades. Because of their effectiveness and cheap production, they are commonly used for introducing nutrients, maintaining soil quality, sequestering carbon, improving the microbiome, disease resistance, drought tolerance, and preventing heavy metal absorption by plants. This research aims to understand the effects of combining biochar with compost products and distinguish which are best for switchgrass plant growth. Four treatments were used: biochar-compost (BC), biochar-compost tea (BT), biochar-compost-compost tea (BCT), and a control (Control). The tallest surviving plants were measured regularly to determine the plants' height and width growth rates. The preliminary results indicated that the steepest rise in growth was in the biochar-compost treatment (BC), followed by the biochar-compost-compost tea (BCT) mixture alongside the control (Control), and then biochar-compost tea (BT). The results have shown that biochar-compost (BC) treatments do best for plant growth overall although more information needs to be gathered long-term before reaching a definitive conclusion.

Carissa Fong, carissa_fong1@baylor.edu
Baylor University, with Dr. Mary Lauren Benton
Bioinformatics

Predicting Gene Expression in *S. cerevisiae* From Random Promoter Sequences Using Machine Learning Methods

Phenotypic variation in eukaryotes is largely determined by gene regulation. While the protein-encoding areas of the genome are responsible for creating the compounds that result in a specific phenotype, the regulatory regions of the genome add further complexity that determine the observed phenotype. One such region is the promoter, which is critical for the expression of all genes. However, the "regulatory code" of the promoter -that is, how its sequence relates to the expression level of its associated gene -is not very well understood. In the present study, we aim to obtain a better understanding of the relationship between a promoter's sequence and strength by utilizing machine learning methods to predict the level of gene expression from a yeast promoter sequence. We also compare the performances of various machine learning algorithms to determine the optimal strategy for predicting gene regulation. We find that the models trained on 3-mer data performed decently well in both classification (accuracy= 0.69, FI = 0.69) and regression (RMSE = 1.95, R2 = 0.32); however, there is still much room for improvement. In the future, we plan to test nonlinear models such as neural networks to determine if they are better able to capture the relationship between sequence and expression. We also hope to train and test our models on a more powerful machine to improve runtimes and enable the use of larger datasets. Further research is needed to uncover whether models trained on yeast promoters can be extrapolated to other organisms, including humans.

Carolina Pinales, cpinales1@mail.stmarytx.edu
St. Mary's University, with Dr. Heather Hill
Psychology

Recognizing Bonds and Attachment Relations in One Beluga Whale (*Delphinapterus leucas*) Mother-Calf Pair

John Bowlby's theory of attachment is found to be a way of explaining why bonds are important in being formed for both physiological and psychological needs to be met in human offspring. However, attachments also exist within and between species. This study examined 11.71 hours of video recordings of a beluga (*Delphinapterus leucas*) mother-calf pair housed at SeaWorld Texas over two years of the calf's life. It was expected that as the calf matured, mother-calf swims would decrease while solo swimming increased. The duration of a myriad of behaviors were recorded and included mother-calf swims, solo swims, affiliative behaviors and agonistic behaviors. Although mother-calf swims stayed consistent across the first two years, solo swimming initiated increased. Evidence of secure base and safe haven use was observed between the calf and his mother as was maternal intervention and other caregiving behaviors by his mother. These different interactions suggest that the bond between the mother and calf could be described as an attachment. Additional study of beluga mother-calf relationships could determine if belugas form specific types of secure or insecure attachments.

Casandra Rodriguez, crodriguez20fl@ollusa.edu

*Our Lady of the Lake University, with Dr. Brittany A. Chozinski
Psychology*

Can cartoons help build empathy and social cues for children who have displayed symptoms of antisocial personality disorder?

The purpose of this research is to determine if children with a conduct disorder or antisocial personality disorder diagnosis can build social cues through cartoons. There has been little research that focuses on potential positive impacts on children who have conduct disorder or antisocial personality disorder diagnosis. There has been research involving children from the autism spectrum who use cartoons, videos, animations, or games to introduce social cues. It is important to provide children with positive learning opportunities to help them build a sense of security and strong relationships with their peers and authority figures. Analyzing the social cues that are portrayed in specific cartoons can be a useful way to learn about the skills that are necessary for effective social interactions. As well as looking at how the cartoon creators were able to simplify the behavior for the children to understand without the message being overwhelming that children are not able to grasp the concept. Depending on the collection of skills identified, research findings could potentially be used to create a cartoon at a later date.

Christina Lopez, christina.lopez@students.tamuk.edu

*Texas A&M University- Kingsville, with Dr. Matthew Alexander
Chemical Engineering*

Testing Effectiveness of Nitrate-Reduction Through Utilization of a Biowall in a Simulated Groundwater Scenario

Nitrates, in small amounts, pose no perceivable effects to the average person; however, when present at higher concentrations, the effects of nitrates not only prove deleterious for the human body, but for the environment and its ecosystems, as well. In such cases, pregnant women and their unborn children are at a particular risk for adverse health effects. As for the environment, excess nitrates can result in algal blooms on bodies of water, which entirely disrupts the ecosystem and is detrimental to the survival of most aquatic life present. This investigation will entail the experimentation of multiple soil columns to be used as “biowalls” to curb the presence of nitrates in simulated groundwater samples. This included an apparatus containing four different soil columns, each with varying compositions of sand, soil, and mulch. The presence or lack thereof of *Pseudomonas* sp. and emulsified vegetable oil (EVO) were also used to determine the most effective approach for nitrate removal in the contaminated groundwater. Through this research, it is expected that the composite bioactive soil mixture will remove a substantial concentration of nitrates, which suggests great potential for groundwater treatment.

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*Southeastern Oklahoma State University, with Dr. Joseph Simons-Rudolph
Psychology*

Analyzing the Structure of the Emergency Management Degree Programs

An important part of the Federal Emergency Management Agency (FEMA) has been the development and support for the growth of the academic field of Emergency Management. One effort started in 1994 is the FEMA Higher ED College List of the academic programs in and related to Emergency Management. Recent research (Simons-Rudolph, 2020) has found that there are some systematic biases in this type of list, which is self-populated by program faculty across the country. This descriptive study is designed to provide a more accurate estimate of the size and characteristics of the academic programs in Emergency Management. (Simons-Rudolph, 2020). We have collected both quantitative and qualitative data from the websites of the academic programs listed on the FEMA Higher Education College List. This data included several basic characteristics of the programs including, but not limited to: (a) program names, (b) degree offered, (c) College where the program is located, (d) number of required credits, and (e) how the programs are delivered (e.g. traditional vs online). This data will be used to provide descriptive characteristics of the academic programs along with some simple comparisons between different program types (degree, concentration, and certificate) across academic levels (Associates, Bachelors, Masters, and Doctoral). This data will provide a more rigorous and accurate estimate of the size and characteristics of the field of Emergency Management for the FEMA Higher Ed Program.

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*Baylor University, with Dr. Kelsey Ragan
School Psychology*

Do Motor Skills Matter? Using Written expression through CBM

In the United States, one in 36 children has been identified with autism. Children with autism often experience delays in communication in forms of non-verbal, verbal, and written. (CDC, 2023) Students in the education system use writing as a crucial part of their learning and understanding of the real world, which attributes to their identity as a whole. (Himmah et al, 2022) Students with ASD[GR1] are also assessed in the education system through a form of Curriculum-Based Measurement (CBM) Students with Autism Spectrum Disorder (ASD) have been shown to have lower scores in their WE-CBM. In this study, handwriting samples were coded from 10 elementary school students; 8 male and 2 female (50% White, Non-Hispanic/Latino n=5, 50% Hispanic/Latino n=5); participant ages ranged from 5-11 years old. These students were given two minutes to write from a prompt. These samples were then assessed through the Handwriting Legibility Scale (HLS) and double-coded to achieve inter-rater reliability. The purpose of this study is to identify and gain a better understanding of the potential impact of handwriting assessments of students with Autism. The question guiding this research project is, "How can these students be accurately assessed through their written expression in CBM standards if they have handwriting impairments that may hinder their results?".

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Physics*

The Use of Spectroscopic Modulation to Study the Application of Sonication on Perylene Diimide Organic Thin Film Formation

Spectroscopic modulation depth measurements have been used to investigate the exciton dynamics in PDI-C3 molecules. The application of photoluminescence anisotropy is applied to aggregates of PDI-C3 to explore the effects on exciton recombination. An experimental observation shows that the emission spectra and resultant modulation depth are affected by the film being sonicated during the dry process. The process of sonication did not appear at first to be useful, but the introduction of a PMMA host matrix dramatically improved the results of the sonication. The energy imparted by the sonication had a distinct impact on the formation of the film. The sharp changes of energy being imparted by square wave sonication caused less aggregation than smooth sine wave sonication, resulting in larger concentrations of short wavelength emissions. This when combined with relatively high modulation depth provides evidence that sonication assisted drop casting can lead to high quality films.

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Interdisciplinary/Sociology*

Young Adults' Perceptions of Intimate Relationships and Family Units in Correlation with ACE (Adverse Childhood Experiences) Scores

The purpose of this research study is to determine if higher ACE (adverse childhood experiences) scores negatively affect young adults' perceptions of intimate relationships and family units. There is the lack of current research pertaining to ACE scores and young adults' willingness to enter into intimate/familial relationships. The research method used for this research study is mixed methodology. Phase one of the research will contain an anonymous survey sent out to participants that contains the ACE questionnaire along with questions which correspond with quantitative data collection. Phase two of the research will be follow-up interview that is optional which corresponds with qualitative data collection. Mixed methodology is used to comprehensively determine the results of both the survey (quantitative data collection) and interviews (qualitative data collection) utilized in the study. The population being studied are college students from Emporia State University and Johnson County Community College who are between the ages of 18-24. Stratified sampling will be used to gain a random sample of college students while convenience sampling will be used to obtain participants for the optional follow-up interview through the survey. The proposed research study will help to fill in the research gaps described and provide insight into how future relationships may be affected by the childhood trauma experienced by young adults.

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Biology*

How Artificial Light at Night Affects the Behavior and Fitness of House Sparrows

Human activities change habitats faster than local species can adapt, threatening many with extinction. Loss of biodiversity degrades ecosystem functioning through the loss of ecosystem services. Urbanization is one such activity presenting novel stressors that reduce survival and reproduction. One stressor is light pollution which interferes with natural light-dark cycles and may disturb sleep and wake cycles, perhaps most noticeably in city-dwelling birds. Abnormal light exposure through artificial light at night may perturb behavioral rhythms important for reproductive success (fitness) and survival. It is currently unknown what long-term effects abnormal light has on survival and fitness. This study will inform how artificial light at night correlates with fitness in adult house sparrows (*Passer domesticus*). I hypothesize that artificial light at night dysregulates behavioral rhythms thereby imposing long-term negative effects on fitness. I will assess nocturnal activity and parental effort as proxies for behavior, while offspring survival estimates will inform fitness. Nocturnal activity will be acquired by tracking the movement of subjects with radio transmitters. Parental effort will be the rate at which parents feed chicks, determined through observation of nests. Offspring survival will be estimated using the number and body condition of offspring, calculated using weight and tarsus length. Measures will be compared among three sites around Reno, Nevada exposed to low, medium, and high intensities of artificial light at night. Establishing the strength of the relationship between artificial light at night and fitness will support the implementation of effective wildlife conservation measures.

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Analyzing the Structure of the Emergency Management Degree Programs

An important part of the Federal Emergency Management Agency (FEMA) has been the development and support for the growth of the academic field of Emergency Management. One effort started in 1994 is the FEMA Higher ED College List of the academic programs in and related to Emergency Management. Recent research (Simons-Rudolph, 2020) has found that there are some systematic biases in this type of list, which is self-populated by program faculty across the country. This descriptive study is designed to provide a more accurate estimate of the size and characteristics of the academic programs in Emergency Management. (Simons-Rudolph, 2020). We have collected both quantitative and qualitative data from the websites of the academic programs listed on the FEMA Higher Education College List. This data included several basic characteristics of the programs including, but not limited to: (a) program names, (b) degree offered, (c) College where the program is located, (d) number of required credits, and (e) how the programs are delivered (e.g. traditional vs online). This data will be used to provide descriptive characteristics of the academic programs along with some simple comparisons between different program types (degree, concentration, and certificate) across academic levels (Associates, Bachelors, Masters, and Doctoral). This data will provide a more rigorous and accurate estimate of the size and characteristics of the field of Emergency Management for the FEMA Higher Ed Program.

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Secondary Social Science Education

Culturally Responsive Teaching Materials in Secondary Education Social Science Courses

Culturally relevant teaching practices are developing in secondary schools in the United States as a response to the growing diversity of students' cultural backgrounds. Moreover, culturally relevant social science courses provide a unique opportunity to empower learners to change the conditions of themselves and their community for the better by relating the lessons of history and civics courses to their own lives. Therefore, the cultural relevancy of materials used in class to instruct students has become a pertinent measurement of a successful lesson plan. However, the requirements of materials in terms of cultural relevancy and educational institution's measurement of used materials has lacked study and analysis. This constructivist, qualitative research aims to determine the how culturally responsive teaching materials are represented in five secondary social science courses in textbooks, videos, and lesson plans across forty-six purposively selected materials and score them using a rubric to determine their adherence to culturally responsive principles. This research finds that secondary, social science materials are inadequately culturally responsive to all subjects, textbooks, videos, and lesson plans. Further research is recommended to compare the responsiveness of materials which are intended to be culturally responsive to those which are not, and research which analyzes the effects responsive and unresponsive materials have when used in observed classrooms. This research offers the opportunity to direct secondary social science materials towards more culturally responsive modifications.

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Behavioral Neuroscience

Reproductive Rights for Agricultural Workers: The Effects of Pesticides on the Menstrual Cycle.

Endocrine-disrupting chemicals (EDCs) disrupt the normal function of the endocrine system and can subsequently result in long-term and multigenerational adverse health effects. Many pesticides used in agriculture are EDCs; farm laborers and their children are uniquely vulnerable to these EDCs because of their prolonged exposure to pesticides. Despite this, little extant research has considered the reproductive health effects of pesticidal EDCs on farm laborers and their children. Participants in this study completed an online quantitative survey with up to 42 questions that meant to assess their menstrual health and agricultural practices. The survey included questions about pesticide handling practices, frequency and duration of exposure, types of pesticides used, and details about menstrual cycle characteristics such as cycle length, regularity, and symptom severity. Subjects were female-assigned at-birth both children of farm laborers and not. It was hypothesized that there would be a higher prevalence of menstrual irregularities among children of farm laborers compared to controls. Factors such as duration of pesticide use, personal protective equipment, and generational pesticide exposure were considered in the analysis. Results included a higher menstrual dysfunction in participants who had worked in agriculture for more than 5 years. The findings of this study will provide insights into the impact of pesticide exposure on menstrual health by identifying potential risks and trends, thereby informing future interventions aimed at protecting the health of women in agricultural communities.

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Biology*

Production of sweetpotato clean stock using micropropagation and virus testing

The sweetpotato industry in the U.S. is growing and with that growth upkeep of clean stock is necessary. The North Carolina State University (NC State) Micropropagation and Repository Unit (MPRU) acts as a clean center for a variety of crops, one of them being sweetpotatoes. The MPRU consists of virus molecular diagnostics on sweetpotatoes, micropropagation, improving greenhouse conditions and field work on sweetpotatoes. Micropropagation will be used to produce virus-tested sweetpotatoes and these cuttings will be assessed. In addition to the previous methods, molecular diagnostics on sweetpotato plants will be executed to identify viruses on the plant over various seed generations. Over 30 viruses have been found to infect sweetpotatoes worldwide and 6 of them are of interest to the MPRU. There is a lack of clean planting material in the U.S. Therefore, improving techniques of sweetpotato cultivation by enhancing a clean seed program is vital to the sustainability of sweetpotato production in the U.S.

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Psychology*

The Role of Identity Affirmations with Intragroup Marginalization and Depressive Symptoms in Mexican Descent College Students

Intragroup marginalization (IM) is the interpersonal distancing that occurs when an individual displays cultural norms inconsistent with their heritage culture. IM is associated with acculturation, the process by which an individual from a historically minoritized group modifies their values, behaviors, and identities to the majority group. Simultaneously, enculturation occurs when an individual holds on to values, behaviors, and identities within their heritage culture. Identity affirmations are the development of a strong sense of belonging to the heritage culture (ethnic identity affirmations; EIA) and majority culture (American identity affirmations; AIA). Research supports that individuals who feel better about their identities display better mental health outcomes. The present study investigated the relationships between EIA, AIA, IM, and depressive symptoms. We hypothesized that higher levels of identity affirmations would relate to lower levels of IM. Higher levels of IM would then be associated with higher depressive symptomology among Mexican-descent college students in the United States. This study recruited participants through a psychology participant pool and national snowball sampling method. Two mediation models analyzed whether IM mediated the relationship between identity affirmations and depressive symptomology. Both models found that higher levels of IM were associated with higher levels of depressive symptoms. The EIA model found that lower levels of EIA were associated with higher levels of IM. The AIA model found that lower levels of AIA were associated with higher depressive symptoms. These results suggest that encouraging higher levels of EIA may reduce IM experiences and reduce harm to Mexican college students' mental health.

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*University of New Hampshire, with Dr. Elizabeth Moschella-Smith
English Literature*

Understanding the Impacts of Covid-19 on Group Home Staff: The Role of Burnout and Secondary Traumatic Stress

At group homes for youth in the foster care system, staff members undertake a plethora of responsibilities and challenges due to the nature of the services provided. The Covid-19 pandemic exacerbated many of the challenges faced by group home staff, including mental health issues such as compassion fatigue and burnout. Given that youth who do not receive proper care in group homes are more likely to engage in delinquent behavior and report low levels of self-esteem, it is vital to address the needs of group home staff, so they are able to care for youth more effectively. Therefore, the purpose of the present study is to (1) quantitatively examine rates of burnout and secondary traumatic stress among group home staff, and (2) qualitatively explore impact of Covid-19 on group home working conditions and suggestions for improvement. We are currently collecting online survey and interview data from group home staff across New Hampshire, Maine, and Massachusetts. Preliminary quantitative results suggest moderate rates of burnout ($M=2.94$) and low rates of secondary traumatic stress ($M=2.20$). Preliminary qualitative results suggest three overarching themes regarding the impact of Covid-19: (1) difficult to establish and maintain connections with youth, (2) mental health challenges of both youth and staff, and (3) staff shortages during the pandemic placing increased demands on staff. Implications to improve working conditions of group home staff will be discussed. Addressing the needs of group home staff may enhance their ability to provide care for youth in the foster system.

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*St. Mary's University, with Dr. Alan Meca
Psychology*

Where do I Belong? How Acculturative Stress and Discrimination Influences Hispanic/Latinx

Past research has shown that cultural stressors are associated with increased symptoms of depression as well as alcohol and drug use and aggressive behavior among Hispanic/Latinx. Cultural stressors are defined as stressors rooted in navigating multiple cultural streams at once. Despite research documenting the detrimental impact of cultural stress, limited research has identified factors, such as acculturative strategies, biculturalism, and familismo, that may diminish experiences of cultural stress. Utilizing a subset of 1189 (74.5% female, $M_{age} = 20.43$ years, $SD = 3.858$ years) college students from the MUSIC survey, we looked to identify how specific cultural assets uniquely impact cultural stressors (i.e., pressure to acculturation, pressure against acculturation, and discrimination). Results indicated that greater Bicultural Identity Integration (BII) was associated with reduced pressure to acculturate, pressure against acculturation and whether these individuals will perceive higher levels of discrimination. In addition, Heritage and U.S. Cultural Endorsement had a positive association with heritage in pressure to acculturate, while Americanism had a negative association with pressure to acculturate. Finally, findings indicated familismo had a positive association with pressure to acculturate. Our findings emphasize that cultural stressors are heavily dependent on Hispanic/Latinx own acculturative configuration (i.e., endorsement of heritage and US cultures and familismo) as well as how they feel about their two identities. These results are discussed in relation to specific cultural stressors that Hispanic/Latinx face in the U.S. and the need for understanding the relationship these individuals faced with competing cultures.

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*University of Montevallo, with Dr. Andrea Eckelman
Political Science*

Did the removal of federal oversight in elections through the Shelby Co. V. Holder (2013) Supreme Court Case, result in a reduction of minority voter registration in the state of Alabama?

The gutting of Section 5 of the Voting Rights Act (VRA) of 1965 resulted in a reduction of blackvoter registration in the state of Alabama. This reduction is after years of historical disenfranchisement, through the founding of the U.S., the Civil War, Reconstruction, and Jim Crow, black people have historically not been allotted their full rights as citizens, especially at the ballot box (Gerston). The Civil Rights Movement brought forth necessary changes to the United States manifested in the Civil Rights Act of 1964 and the Voting Rights Act of 1965. The VRA significantly enfranchised black voters. Despite this, Section 5 of the VRA, the federal oversight for elections in specific counties and states, was struck down in 2013 by the Supreme Court. Since these counties have made many strides to make voting and voter registration more difficult for black people, this research continues to be vital for the protections of the right to vote for both people of color and citizens of the United States. Further research should seek to explain how the voter registration related to the actual voters in elections. In addition, looking at why politicians choose to enfranchise and disenfranchise voting for different groups of people.

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Addressing Missingness in Longitudinal Data: Accommodating for Type I Error in Optimal T

Missingness interferes with practitioners' ability to accurately interpret the results of their studies. This is especially true in within-subjects designs as a study with a sufficiently large original sample size might net a much smaller set of complete cases once missingness is taken into account. Contemporary solutions to dealing with missingness, such as regression and multiple imputation, have focused on replacing missing values. Methods such as these that replace missing values rather than delete cases altogether preserve sample size, but they also require a level of sophistication that far exceeds what practitioners can reasonably be expected to have. Recent research has supported the use of between-subjects methods in within-subject scenarios as a means by which to manage missingness in a highly accessible manner. The present study builds on this earlier research by considering whether a new strategy, Optimal t, maintains statistical power in the face of missingness without artificially inflating alpha. Optimal t selects the better option between a paired samples and an independent samples t-test based on simulated trials. Initial research has supported the use of Optimal t, although there has been some concern about inflated Type I error rates (Sperling et al., 2023). In this study, a correction formula is introduced which adjusts p-values in proportion to sample size and compared the results against original Optimal t, paired samples t-test and independent samples t-test. Results suggest that original Optimal t outperforms all other options across conditions. Implications for practice and recommendations for further research are provided.

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*Our Lady of the Lake University, with Dr. Dietrich & Dr. Clark
Computer Information Systems and Security*

Understanding the psychological impacts cyber-attacks have on employee's

Cyber-attacks happen on a daily basis every second globally towards businesses. Threat actors intentionally attack this business in order to have financial gain or gather information for a much larger target. During these attacks internal user mistakes are normally the root cause for any attack occurring. This research investigates the emotional and behavioral impacts employees have after a cyber-attack. The data collected are from literature material such as a dissertation, blogs, case studies, and academic journals, using a meta-analysis approach with qualitative analysis. In the greater body of psychology and cybersecurity research, the lack of research focused in this area has a knowledge gap unknown to the field because of limited information publicly available. Most research provided approaches about what cyber-attacks can do, or the damage it can cause. However, none presents useful information for future research studies about developing human element response plans. The result of this study aims to convey needed response plans for employee's, also known as end-users because there are few to none. Currently there are no results or findings yet for this interest. All information that's gathered from the literature is planned to be used as evidence for this research results/findings.

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Social Work*

Recidivism: What are the Hispanic Male Experiences

In the United States, 600,000 inmates are released back into society with majority being released to parole or some type of supervised probation (Incarceration & Reentry. 2023.ASPE. Retrieved April 11, 2023, from <https://aspe.hhs.gov/topics/human-services/incarceration-reentry0#:~:text=At%20any%20one%20time%2C%20nearly%206.9%20million%20people,individuals%20are%20released%20from%20state%20and%20federal%20prisons>). This research is aimed better understanding the lived experiences of Hispanic men in Texas who have been processed by the criminal justice system. This research looks at recidivism and approaches that are being used by the criminal justice system and if this is consistent with the experiences of Hispanic men in Texas. Understanding the experiences of Hispanic men who are 18 years or older, who have served in jail or prison for more than 30 days, and who have offenses related to violence, drugs or theft will guide social workers in making programming that is framed around pathways that work for this population. This research is aimed to help understand that narrative of Hispanic men in Bexar County have lived experiences from exiting the criminal justice system and, to see what solutions they to offer based on their experiences. Their experiences can help guide or create ideas and programs to help others stop reoffending to ultimately reduce recidivism within the community of Bexar County and other counties in Texas. By using a qualitative research approach, the researcher will look for patterns and themes from the data collected.

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Baylor University, with Dr. Jessica Akers

Educational Psychology

Sibling Implemented Mand-Training to Increase Mand Variability in Children with Autism

Children with autism spectrum disorders (ASD) may struggle with engaging in prosocial behavior that aligns with their typically developing peers due to difficulty in verbal and social skills. Children with ASD often receive behavioral interventions to promote acquisition of verbal behavior and social skills. Researchers and clinicians commonly implement these behavioral interventions. However, it is important to evaluate the extent to which family members can implement these interventions. The purpose of the current study was to evaluate a sibling-implemented intervention consisting of script training and a lag schedule of reinforcement to increase mand variability. Mand variability refers to requesting for items using different phrases such as “can I have”, “I want”, and “may I please have”. This research was completed under the mentorship of Dr. Jessica Akers, Assistant Professor of Baylor University’s Educational Psychology Department and through Baylor University’s McNair Scholars Program. We conducted the study in a clinical setting and used single-subject research design. We conducted 12 5-minute sessions using a reversal design, examining how sibling implementation of scripted mand training impacts the social skills and mand variability of the child with ASD. A secondary purpose of this study was to assess qualitative changes in the dynamic between the child with ASD and their typically developing sibling. We observed an increase in mand variability in our participant with ASD, indicating that the sibling-implemented intervention encourages both prosocial behaviors and verbal skill acquisition in children with ASD. Future research could examine the efficacy of script fading in sibling-implemented mand training.

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Baylor University, with TERC NSF REU Dr. Smirla Ramos-Montanez & Dr. Scott Pattison

Education

Highlighting Latine Family STEM Talk and Beliefs through Early Childhood STEM Learning Programs

STEM education systems can change to support the assets of Latine families and learning from families must be the starting point. Emerging studies suggest that experiences with STEM in early childhood provide a critical foundation for long-term STEM-related engagement and career pathways. At this early age, talking with family members about STEM topics has been shown to contribute to STEM identities and exploring different ways of engaging with STEM (Dou et al., 2019). However, more research is needed to understand the nature of this talk within families and how it supports aspirations within specific fields, especially for Latine families with young children. In this study, we examined the beliefs that Latine families had before and after participating in early childhood engineering programs with their children and how they may utilize STEM talk to raise awareness of and develop interest in various STEM fields. To further investigate this, we conducted in-depth semi-structured qualitative interviews with three Latine families that participated in early childhood engineering programs. We used a Community Cultural Wealth (Yosso, 2005) framework as a general approach for STEM talk. By the end, we hope to highlight the ways early childhood engineering programs can engage STEM talk within Latine families and their assets that support their children’s STEM interests. This work will lead to new research on the significance of early childhood, family-based engineering programs and how STEM talk manifests among families. This research will increase awareness of asset-based approaches among researchers, educators, and practitioners when working with Latines.

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Baylor University, with Dr. Tricia Blalock

Health Science Studies

A Comparative Study of Healthcare Systems in the United States, France, Spain, and Costa Rica

The field of medicine is consistently adapting to better improve the assistance that is provided to people in need, yet countries globally have developed diverse healthcare systems, some public and others privatized. This study explores and compares the healthcare systems of the United States, France, Spain, and Costa Rica, focusing on their patient-doctor relationships and medical practices. Through extensive background research encompassing demographic diversity, major health concerns, lifestyle, and cultural factors, the interactions between healthcare facilities, practitioners, and patients in each country were examined. Comprehensive insights were achieved from questionnaires and semi-structured interviews that were asked of both healthcare practitioners and patients residing in each nation to distinguish between the system's availability to the people, techniques and practices performed, availability of resources, and patient-doctor relationships. The initial findings suggest that while resources and medical practices were uniformly consistent in each nation, the countries that offered universal coverage of healthcare services, France, Spain, and Costa Rica, observed greater indications of trust in practitioners, leading to increased patient utilization of medical services; however, the United States exhibited a burden in their patient-doctor relationship from concerns over cost and coverage, causing skepticism towards healthcare professionals' capabilities. The study highlights the significance of cultural context and healthcare accessibility in shaping patient perceptions and experiences. As the medical community seeks to improve patient care and satisfaction, the insights from this study can serve as a valuable resource for policymakers and healthcare practitioners in enhancing healthcare systems worldwide.

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Texas Tech University, with Dr. Jon Crider & Dr. Latricia Philips

Architecture

Towards a Sustainable Future: "Investigating Net Zero Buildings and their Impact on Environmental Resilience"

The urgent need to address climate change and cut carbon emissions grows more obvious in today's world of fast change. In the fight for sustainability, net zero buildings, which attempt to balance the energy they use with renewable energy generation, have emerged as a possible answer. In addition to reducing their environmental impact, these advanced buildings promote resilience in the face of climatic problems. Given the growing organization of today's population, expanding research to fulfill the need for sustainable energy is essential to today's civilization. Future strategies, recommendations, and performance analysis are a few of the topics that have been explored in previous studies. This case study will examine five existing net zero buildings in various regions of the world. The aim will be to identify common trends of net zero principles, sustainable building, and resilience measures in the construction of buildings, such as material selection, energy storage, and passive design techniques. This study intends to add to existing literature on net zero buildings and highlight the numerous advantages for future construction.

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Biology*

Exploring Roles of Caveolin-1 in Arterioles of the Murine Heart and Liver

Inspired by the ground-breaking research conducted by the Dean McGee Eye Institute which demonstrates the deficiency of Caveolin-1 can expedite the deterioration of smooth muscle cells in the blood vessels in the retina. Regan et al, (2018), observed the absence of caveolin-1 accelerated the age-related loss of contractile vascular smooth muscle cells (VSMCs) in retinal arterioles. This implies that caveolin-1 deficiency exacerbated the decline in these cells that typically occurs with age. We hypothesized that the knockout of Cav-1 specifically in endothelial cells would lead to changes in the morphology of arterioles located in the heart and liver. The purpose of these experiments was to look into the effect of Cav-1 deletion on cardiac and hepatic anatomy, by utilizing a mix of histology and quantitative imaging analysis. Past studies have shown that when Cav-1 is missing, the absence can disturb the blood retinal barrier and lead to alterations in contractility and structural organization like: hyperproliferative and global vascular abnormalities. Tissue samples were obtained from the Dean McGee Institute as prepared paraffin wax blocks. After microtome sectioning, an Hematoxylin and Eosin (H&E) stain was performed to visualize the gross morphology. Microscopic analysis was conducted to investigate arterioles in the cortical, digital images were captured for quantitative analysis. Statistical analysis included a two-tailed t-test to assess the significance of vessel thickness and normalized vascular smooth muscle counts. The results indicated no statistically significant differences between the Cav-1 knockout and wild-type groups for vessel thickness ($p = 0.4752$) and smooth muscle counts ($p = 0.4019$). In conclusion, our study found no significant differences in vessel thickness and smooth muscle counts between the Cav-1 knockout and wild-type groups, indicating that Cav-1 deficiency does not lead to observable changes in cardiac and hepatic anatomy.

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Anthropology*

"Investigating the History and Origin of an Altered Human Femur."

A human femur that was notched and painted post-mortem was accepted by the former NH State Archaeologist and is now housed at the University of New Hampshire. The femur closely resembles a form of indigenous cultural artifact known as a "bone rattle." The person who surrendered the femur to the former NH State Archaeologist claimed it was used for ritual purposes by the Independent Order of Odd Fellows. If this is the case, it would be more suggestive of a history involving dark tourism and appropriation than an authentic cultural artifact. With the assistance of Dr. Amy Michael, Professor Jack Biggs, current NH State Archaeologist Mark Doperalski, the UNH Instrumentation Center, and various on and off campus entities, research will be done on the femur to answer multiple questions. How old is the femur? Where did it come from? Is the individual of indigenous origin? If not, where did they originate from? Why was the femur altered and by whom? These questions are being explored through a variety of methods, including the creation of a biological profile and the use of X-ray microscopy, radiocarbon dating, a confocal microscope, and paint analysis, along with numerous other potential analyses. This is done with the hope of discovering the most likely origin and backstory of this femur so that the remains can be repatriated and reburied.

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Education*

Photovoice: A strengths-based look into Chicana/Latina first-generation college student success

A photovoice project is participatory action research that requires the participants of the study to be the main source of data collection. This methodology involves photography and discussions amongst other peers in the study. As reported by the National Center for Education Statistics College Enrollment Rates, since 2000 the percentage of Hispanic women enrolled in college has steadily increased. The purpose of the researchers using photovoice for this study is to bring awareness to First Generation Chicana/Latina and impart voice on their experiences that helped them through their post-secondary education, as well as what cultural factors or skills attribute to their success. The research will be over a three-day period. On the first day, participants will be informed about the research, how to be active participants, and how the study will proceed. On the second day of the study, participants will be asked to take pictures from their daily lives and caption the picture explaining how the image answers the research question. On the third day of the study, participants will be gathered to discuss all submitted photos and they will all collectively choose up to 10 photographs they believe best addresses the research questions. The investigators will separately listen to an audio recording of the participants' dialogue to dissect and consider the focused theme of the study. The goal of this research is to increase visibility of First-Generation Chicana/Latinas in post-secondary education by viewing their culturally lived experiences.

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*St. Mary's University, with Dr. Colton Daniels
Criminology, Psychology*

Depression, anxiety, and PTSD: Outcomes of traumatic experience in relation to drug abuse

Depression, anxiety, and PTSD are major public health concerns as they affect over a million Americans every year and have numerous adverse outcomes. Research exploring the linkages between depression, anxiety, and PTSD with drug abuse has remained minimal. Additionally, linkages between mental health and victimization via violent crime (rape and physical assault) are further explored. Results come from the Nashville Stress and Health Study (n = 1,252), which ascertained the stress and health status of predominantly African Americans and White Americans from Davidson County. Results yielded through negative binomial regression indicated a significant relationship between depression and rape, as well as depression and drug abuse. Additionally, a significant relationship was identified between anxiety and rape, anxiety and physical assault, as well as anxiety and drug abuse. Similarly, a significant relationship was identified between PTSD and rape, PTSD and physical assault, as well as PTSD and drug abuse. This study provides insight into the prevalence of drug abuse in relation to depression, anxiety, and PTSD that held association to traumatic experiences via violent crime victimization. Research implications, study limitations, and directions for future research are discussed.

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Communication

The effects of Attachment styles and Family Communication patterns within romantic relationships

Research frequently shows the impact of family communication patterns on individuals' well-being and family functions. However, attachment theory examines the influence of family interactions. Very few studies examine family communication patterns and individuals' attachment orientations. The research instruments used are the Experiences in Close Relationships-Revised (ECR-R) Questionnaire, Fraley, Waller, and Brennan (2000). The (ECR-R) first 18 items comprise the attachment-related anxiety scale. Items 19 – 36 comprise the attachment-related avoidance scale, including the Revised Family Communication Pattern Instrument Ritchie and Fitzpatrick (1990). The RFCP consists of 26 Likert-type items measuring two underlying dimensions of family communication patterns: Conversation orientation (15 items) and Conformity orientation (11 items). The method used to gather participants will be through snowball sampling, using social media to gather participants' data. This study plans to examine how family communication patterns pertain to adult attachment orientations toward their parents and romantic partners.

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Physics

Investigating the Electron-Ion Equilibration Rates in Laser-Excited Metals

In December 2022, the National Ignition Facility made history by achieving controlled fusion for the first time. The goal of inertial confinement fusion (ICF) is to produce fusion power, and as materials are compressed and heated in the fusion process, they pass through a state of matter called warm dense matter (WDM). WDM is too hot to be described by solid matter physics and too dense to be accurately described by plasma physics. Consequently, the behavior of electrons and ions within WDM are ill defined, and thus an obstacle to repeat ICF success. Through laser-excitation, a process that uses ultrafast lasers to heat materials, WDM can be recreated in a laboratory setting. The resulting WDM exists in a non-equilibrium state, meaning the electrons are much hotter than the ions. By studying laser-excited materials, scientists can learn more about the quantum mechanical interactions between the electrons and ions in WDM. Understanding these interactions can be used to validate state-of-the-art models and simulations of fusion energy. This study analyzes the electron-ion equilibration rates in laser-excited silver, copper and titanium. We will fit a two-temperature model to our experimental data to determine the electron-ion equilibration rates in each metal. The results of this research will provide important information about the behavior of electrons and ions within laser-excited materials as they pass through the warm dense phase, which has important implications for the future of fusion.

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*Southern Nazarene University, with Dr. Rosfeld & Dr. Rodin
Politics and Law*

Three- and Ten-Year Bars

This research paper examines how the Illegal Immigration Reform and Immigrant Responsibility Act (IIRIRA) affects immigrant's decisions to pursue citizenship. The IIRIRA, enacted in 1996, introduced the three and ten-year bars under Section 212, which pose significant challenges to undocumented immigrants seeking legal status. This paper specifically explores the perspectives of undocumented immigrants regarding the impact of the three and ten-year bars on their path towards citizenship. To investigate this process, interviews with undocumented Latino individuals were conducted to gain insight into their experience navigating their legal immigration process. These interviews captured the narratives of undocumented immigrants, providing insights into the complexities and hardships they face in their pursuit of legal status and citizenship, including the onerous three- and ten-year bars put in place by the IIRIRA. Findings suggest that the IIRIRA's bars complicate the process of obtaining legal status for undocumented immigrants, create obstacles that lead to prolonged separation from family members, and produce economic hardships, and emotional strain. These findings emphasize the need to reform the three- and ten-year bars to keep families unified and reduce hardships for them. Furthermore, by reforming these bars, undocumented immigrants can be offered the opportunity to naturalize, enabling them to emerge from the shadows and fully integrate into society

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Psychology*

The relation between intersectionality, stress reactivity, and trauma history in Latinx young adults

Many in the Latinx community face stressors that compound at the intersection of their identities, for example, at the intersection of immigrant and first-generation student identity. These stressors are exacerbated by sociocultural barriers to mental healthcare, including a deficit of socially conscious, bilingual therapists. Previous studies have used self-reported screenings of PTSD but these undercount Latinx people due to mental health barriers that prevent them from identifying symptoms of psychiatric disorders and also having a small Latinx sample; however, we aim to fill in the gap concerning self-reported screenings by utilizing a Clinical Administered PTSD Scale for DSM-5 not to diagnose but clarify the presence and severity of related PTSD symptoms. My objective is to measure the following variables: intersectionality in Latinx communities, mental health barriers, PTSD symptom severity, and cortisol levels. The multi-method approach will include self-report questionnaires, saliva collection for stress analytes, and a clinical interview. I have four main hypotheses: intersectional Latinx community members will face more mental health barriers compared to those who do not have an intersectional identity, mental health barriers are positively correlated with PTSD symptom severity, Latinx community members facing more mental health barriers will have higher cortisol levels than their counterparts in the white community, and trauma-exposed people in the Latinx community that identify with an intersectional identity will have higher PTSD symptom severity. The results will show how intersectionality in the Latinx community is associated with the stress response system and imposes higher rates of trauma exposure.

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Psychology

The Face of Narcissism: How Caregivers' Narcissism Affects Children's Emotional Perception in Faces

Preschoolers have a basic understanding of facial emotion expressions, and it may be influenced by the care of the parents. This study examined how the development of facial emotion perception in children was impacted by caregivers' narcissism levels. There is lack of extensive research on this age group and the effects of narcissism. Caregivers completed a survey measuring narcissism, perceived socioeconomic status, and maternal education. Narcissism was measured using a shortened version of the Narcissistic Personality Inventory (NPI-16). Children ages 3-5 viewed eight adult models expressing four emotions. The children's perception of the models' emotion was analyzed according to the sex of the participant and the sex of the model. The perceived intensity of the emotions was recorded using a Likert scale of 1-5 (5 = highest intensity). Correct identification of the emotions was expected to be higher for the female models than the male models, and this hypothesis was confirmed, $t(20) = 2.27, p = .04$. A negative correlation between the intensity of male sad faces and caregivers' narcissism levels emerged ($r = -.68, p = .05$). Perceived socioeconomic status was negatively related to caregivers' narcissism ($r = -.55, p = .05$). Results revealed a positive relationship between maternal education levels and overall intensity ratings for female anger ($r = .54, p = .01$). The differences might be due to exposure to facial emotion expressions and socialization. More nuanced results might be discovered with varying levels of intensity in facial emotion expressions and more detailed measures of narcissism.

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Environmental Science

Degradation of Plastic Nurdles using Mechanical and Enzymatic Degradation

From our daily cups of coffee to cutlery and food packaging, plastics have become indispensable, especially in the food and drink industries. Many of our plastic products are formed from malleable plastic beads called nurdles. Nurdles are hard to keep packaged because of their small size. One major issue in plastic pollution is that the nurdles and the final plastic product do not degrade. This issue has encouraged researchers to research possible routes of degradation through physical, chemical, and biological mechanisms. Each process is different, but all methods ultimately break the bonds in the backbone of the plastic polymers into oligomers or minerals. For this study, mechanical grinding and enzymatic digestion were used separately and in combination to force plastic degradation. Materials were ground with a mechanical blender over varying times and temperatures. Further, the resultant degraded plastics were subjected to specific enzymes that bind to a specific plastic surface. Each plastic was analyzed for differences in surface features before, during, and after the degradation process using Fourier Transform Infrared spectroscopy and Scanning Electron Microscopy. Our preliminary results show that mechanical grinding increases the surface roughness of plastics and produces micronized flakes and particles that are easily removed from the larger plastic surface. In addition, the enzymatic degradation increases the oxidation of plastic surfaces which further helps to make the plastic brittle. These degradation processes have been shown to be effective in the literature, and this study will contribute to the knowledge of plastic degradation processes.

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Sociology

Can Self-love Mitigate Occurrences of Infidelity in Committed Romantic Relationships

Of the possible harmful practices that may occur in a committed romantic relationships, notable among them is infidelity. While there are myriad motivations that may compel someone to engage in infidelity, this study will focus specifically on researching whether behaviors and practices of self-love can potentially mitigate engagement in infidelity. It is my hypothesis that the typology of self-love is foundational to all other typologies of love. I further believe that this hypothesis is critical to better understanding those typologies of love and how they are practiced. The very nature of this hypothesis would suggest that the starting point should be self-love's effect on other typologies of love, where there would appear to be a lack of research. The objective of this research will be to evaluate how much the independent variable of self-love can reduce an individual's tendency to engage in the dependent variable of infidelity. To achieve this, a purposive survey will be conducted and analyzed utilizing a sample of local residents with questions meant to determine their disposition towards engaging in infidelity and the likelihood that self-love [Which for the purposes of this study will be defined as acts of self-compassion and self-care practices.] can mitigate an individual's motivations or propensity to engage in acts of infidelity. The results of this study will be compiled into an academic paper to be presented and ultimately published.

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Public Health

Suicidal Ideation, Unsafe School Environment, Technology Usage, and Depression in Relation to Substance Usage

Suicidal ideation, feeling unsafe at school, amount of technology usage, and depression are correlated to increase substance use among adolescents in Texas compared to the United States. Substance use is a major public health concern in the United States and understanding the factors associated with use in adolescents may help lower rates of alcoholism in adulthood. Furthermore, the impairments caused by substance use on the development of the brain is well documented in the literature. A comprehensive literature review was conducted prior to data analysis. Following the literature review, SAS 9.4 was used to analyze data from the Youth Risk Behavior Survey at the Texas state level and nationally. Results are still being assessed and future areas of research are still being hypothesized.

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Neuroscience

Using Analyze 2D/3D Skeleton to evaluate astrocyte morphology in response to a murine model of hyperglycemia

Diabetes mellitus is a group of metabolic disorders associated with hyperglycemia. Over 11% of US adult population are diabetic and another third of the adult population is prediabetic. Diabetic and pre-diabetic states increase risk for developing dementia, including vascular dementia and Alzheimer's Disease. The mechanisms underlying this link are

still not fully understood, but likely involve many factors including lifestyle (e.g., diet), genetic risk factors, stress of disease management, and hyperglycemia itself. Our lab has been utilizing the streptozotocin (STZ) murine model of chronic hyperglycemia to understand the effect of hyperglycemia on the brain and behavior. Within the current project I sought to specifically examine the impact of hyperglycemia on astrocytes, a non-neural cell involved in brain metabolism and homeostasis implicated in the development of dementia. Prior data from our lab evaluated astrocyte reactivity four weeks post hyperglycemia using immunohistochemistry (IHC) for GFAP. The data revealed a non-significant trend toward reduced astrocyte activation in STZ mice. Our failure to detect differences may be related to the blunt measure of fluorescent intensity employed. I hypothesized that utilization of more sophisticated analysis of cellular complexity using the Analyze 2D/3D Skeleton ImageJ plug-in will be sensitive enough to detect changes in cellular complexity induced by STZ. I also propose to evaluate astrocyte reactivity after a longer exposure to hyperglycemia (23 weeks vs 4 weeks) to understand progression over time. I will present data comparing these two image analyses methodologies.

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Pre-Law & Criminal Justice*

Oklahoma County Jail Death and Overcrowding; An Issue Surrounding Mass Incarceration

The Oklahoma County jail in Oklahoma City has a long and troubling history. The current issues plaguing the jail are understaffing, flooding, overcrowding, and an inability to service the medical needs of inmates. This has led to numerous deaths in the prison with 16 reported in 2022 alone. These issues are a byproduct of mass incarceration as a whole. While the county recently approved a bond for a new jail, a new building is just a short term solution. These issues within the jail are more prevalent than assigning a short term solution, like building a bigger jail, to the long standing problem of mass incarceration which only furthers prison overpopulation and deaths. To truly deal with the numerous issues plaguing the jail, potential solution oriented ideas of decreasing incarceration rates will be discussed. These solutions will make the Oklahoma carceral system a safer environment for those inside like those incarcerated and the staff. The rates at which the United States incarcerates individuals does a disservice to the goal of incarceration which is to decrease recidivism. Therefore, Oklahoma county needs to reallocate resources to bringing about jail reform policies other than making our county jail problem an issue of structure. My research will show that Oklahoma county building a bigger jail will not fix the overpopulation issue and the deaths that are taking place, however, addressing the fundamental issue of mass incarceration and jail reform will.

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Biochemistry*

Fluorescence Anisotropy to Further Elucidate Rad4-TFIH Dynamics

The nucleotide excision repair (NER) pathway is triggered when the XPC–RAD23B–CETN2 trimeric complex initially identifies DNA lesions within the genomic DNA. Subsequently, this adept complex recruits the general transcription factor complex, TFIH, to facilitate the process of lesion verification. The precise structural mechanism underlying the recruitment of TFIH by Rad4/XPC and its role in initiating nucleotide excision repair (NER) remains elusive due to the inherent constraints imposed by the current structural resolution, in the range of 7.9-9.6 Å. Using reversible molecular photoswitches alongside fluorescence anisotropy we hope to aid in obtaining a higher resolution structure.

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Exercise and Nutrition Science

Is The Mediterranean Diet Special?

The Mediterranean diet, first coined by Ancel Keys in the 1960's, is a diet pattern which has been purported to be the gold standard of all diet patterns. The Mediterranean diet has been recommended for general health, weight loss, and heart disease prevention by many physicians and health organizations for many years; and for good reason. Perhaps the most well researched diet in the world is the Mediterranean diet and a majority of the research is in consensus of its health benefits. However, there is currently not enough evidence to support the Mediterranean diet being labeled as a gold standard. Despite all of the evidence for the Mediterranean diet and its health benefits, there is no clear consensus on its definition and common recommendations for food quantity and type are generalized. Furthermore, there are other diet patterns that provide functionally similar health effects such as the Okinawan diet and DASH diet.

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Psychology

Mental Health Stigmas Within the Military Community: How Hispanics/Latinx Community May be Further Affected in These Groups

The public is aware of the impact Mental Health (MH) issues, yet we live in a society where we often turn a blind eye to individuals' pain and suffering. In the military and veteran community, MH stigmas have been engraved as trivial components of their occupation overcast deeper MH issues. In the United States, military personnel report the prevalence of MH stigma, and it is estimated that nearly 60 percent of active personnel who experiences symptoms related to MH illness do not seek help. This is attributed to a military culture that promotes confidence among soldiers. Service members believe that by admitting suffering from MH problems, they will likely be treated as weak. On the other hand, cultural stigma among Latinos, a culture that promotes family ties, contributes to MH stigma among the Latino military community. It mainly prioritizes family needs over individual needs, which may deter soldiers from this ethnic community from seeking MH treatment. Surveys will be conducted through questionnaires to collect qualitative data, participants will have a chance to opt in for a follow-up if they struggle with finding psychotherapy resources. Results of this research will advance understanding on how ethnic and minority groups are further affected by previous MH stigmas when incorporated into a group that reinforces these negative patterns and behaviors.

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English Literature

Distracting or Didactic: Understanding the Purpose of Dialect in Victorian Scottish Working-Class Poetry

For around 100 years, scholars have disregarded Scottish working-class poetry from the Victorian era due to its supposed irrelevance, leading to a gap of knowledge in the field. Many believed that the poetry's heavy use of dialect

placed it in a category that did not need to be studied because it did not realistically represent the people of the Victorian era, but by avoiding the study of this body of literature, scholars have strayed away from understanding the class of individuals that it represents—the working class. This study aims to combat the stigma of irrelevant Victorian working-class poetry by researching a set of dialect poems published in and near Glasgow between 1866 and 1882 within the context of greater historical movements to understand their cultural relevance. It was discovered that these poems speak more truthfully to the people they represent than previously researched literature by working as a means to preserve, grow, and represent working-class values and traditions.

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Maternal and Child Health*

Enhancing Maternal Support and Infant Feeding: A Pilot Review of One FQHC Lactation Clinic

Although most women opt to feed human milk to their infants, a vast majority do not meet their breastfeeding goals. Facilitating forms of lactation support that extend the duration of breastfeeding may lead to significant physical and emotional benefits that are dose responsive. The purpose of this study is to measure the duration of breastfeeding among participants in the Waco Family Medicine lactation clinic compared to breastfeeding rates resulting from usual care at one Federally Qualified Health Center (FQHC). The research methods include comparing breastfeeding duration among clinic participants to standard rates at one FQHC. The study specifically targets low-income individuals, most of whom are enrolled in a Medicaid managed care organization. The results of this pilot may provide initial insights into the potential benefits of lactation support interventions in improving breastfeeding outcomes in underserved populations. Compared to usual standard care, patients that received lactation support through the Waco Family Medicine lactation clinic extended lactation duration by at least 32.2%. Results from this study may suggest early indications that primary care lactation support is related to breastfeeding duration. The findings may contribute to the implementation of analogous interventions in other underserved communities. Additionally, this pilot study may be used to inform future breastfeeding interventions aimed at extending breastfeeding duration and enhancing maternal and infant health outcomes among FQHC patient populations.

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Music Education*

Texas Music Educators' Perceived Effectiveness of Inclusion

To make music accessible for all students, some students require accommodation or modification of general music lessons, along with instrumental classes such as band and orchestra. Students with disabilities are often included in music classrooms in a variety of ways, which may differ based on the student or school system. The purpose of this study is to evaluate Texas music educators' perceived effectiveness of inclusion in music education classrooms. For this study, survey questions included experience teaching students with disabilities, practices in their classroom, and administrative support they receive when teaching students with disabilities. This study will assess current trends in inclusion in Texas music classrooms, educator knowledge and experience working with students with disabilities, and administrative support for educators when working with students with disabilities. Research questions are as follows:

- i. Are there differences among Texas music educators' perceived effectiveness of inclusion, curriculum adaptations/modifications, or student achievement based on years of teaching experience or specialty area?
- ii. How frequently do music educators address music versus non-music objectives as their primary teaching focus when working with students with disabilities?
- iii. What are the similarities and differences among Texas music educators' perceived effectiveness of inclusion, curriculum adaptations/modifications, instructional support, or student achievement found within the current study and the results found within the VanWeelden and Whipple (2014) study?

Hypothesized outcomes include moderate differences of inclusion between teaching experience and specialty eras. Hypothesized outcomes also include a substantial amount of response noting lack of training to work with students with disabilities in educator pre-service training and professional development.

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Computer Science

Translating Custom Language to Assembly: A Python-Based Parser, Lexer, and Compiler

This project presents a Python-based implementation of a custom language parser, lexer, and compiler, aiming to provide a comprehensive toolset for translating code written in the custom language into assembly language for a virtual machine. By enabling execution on virtual hardware platforms, this project facilitates the development of domain-specific languages and their seamless execution. The project begins with designing and implementing a lexer module that identifies meaningful tokens by applying predefined grammar rules and regular expressions. Building on the lexer, the project constructs a parser module that generates an abstract syntax tree (AST), representing the hierarchical structure of the code. Next, the project implements a compiler module responsible for translating the AST into assembly language instructions for a virtual machine. The compiler incorporates optimization techniques to enhance efficiency and performance. To validate the toolset's effectiveness, a comprehensive set of test cases covers various grammar and semantic aspects of the custom language. These test cases ensure accurate translation and execution of custom language code into assembly language for the virtual machine using the parser, lexer, and compiler modules. This project demonstrates Python's versatility and power in developing language processing tools. It provides a comprehensive solution for translating custom language code into assembly language for a virtual machine, enabling seamless execution of domain-specific languages on virtual hardware platforms. The toolset's extensibility allows for future enhancements, including optimization techniques and support for diverse virtual machine architectures, expanding its utility and impact.

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Molecular Microbiology & Immunology

Exploring the Role of General Amino Acid Permeases in Mediating *Candida albicans* Sensitivity to the Calcineurin Inhibitor Drug FK506

The limited number of antifungal treatments currently available, and the rising prevalence of drug resistance, necessitates the urgent development of novel therapeutic options. Repurposing existing drugs provides advantages of speed and reduced cost. Calcineurin inhibitors, such as FK506, are currently used as immunosuppressants to prevent

transplant rejection and it is already known that blocking calcineurin function impacts the virulence of many fungal pathogens. Calcineurin represents a potential pan-fungal drug target and efforts to develop fungi-specific inhibitors are ongoing. However, not only are fungi known to develop resistance to such inhibitors, the cellular pathways controlled by calcineurin are incompletely characterized. Recent studies in *Mucor circinelloides* revealed that mutations in a general amino acid permease (GAP) encoding gene conferred resistance to FK506, highlighting its previously unknown function in calcineurin signaling. A similar role for GAPs was also found in *Cryptococcus neoformans*, suggesting this regulatory circuit exists across diverse fungal pathogens. To that end, we explored the role of GAPs in mediating *Candida albicans* sensitivity to FK506. Our initial experiments established that none of the six individual gap(Δ) mutants were resistant. To examine the opposite effect, we overexpressed GAPs, hypothesizing that this should increase sensitivity to FK506. Through analysis of strains overexpressing GAP1 or GAP5 we discovered that Gap5 influences FK506 sensitivity whereas Gap1 does not, indicating partial redundancy of Gap function in *C. albicans*. We are now confirming commonalities with the pathway in other fungal species and plan to perform a genetic screen to identify as-yet unknown components.

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University of New Hampshire, with Dr. Feixia Chu

Epigenetics, Proteomics, Mass Spectrometry

Determining the Effects of Acetylation and Deacetylation of H3K56 on Embryonic Stem Cell Stemness

With the newer tool that is the epigenetic field, significant stem cell research currently focuses on the influence of epigenetic markings, such as acetylation— the addition of “a small molecule made of two carbon, three hydrogen, and one oxygen atoms,” to DNA— or lack thereof, on the genetic coding of these cells (National Cancer Institute). The proposed research deals with histone proteins, proteins around which DNA is wrapped, and the specific amino acid lysine, which is positively charged. The purpose is to further understand the consequences of acetylation of the 56th lysine on histone protein H3 regarding stemness of cells, that is the ability to differentiate into any type of cell and to multiply indefinitely. Cells that have an altered genome to emulate acetylated and unacetylated 56th lysine on H3) will be analyzed utilizing mCherrytagging, MNase digestion, SDS-PAGE, and LS-MS coupled with online databases. The analysis will be focused on the difference of protein composition and histone modification of each type of cell. The expected outcome will be for unacetylated mutants to have a lower concentration of other proteins that are related to stemness, such as Oct4, SOX2, and NANOG, indicating that the acetylation of H3K56 may play a fundamental role in maintaining stem cell qualities. (Swain et al., 2020). The proposed research will be helpful for further experiments done on stem cells, embryonic, cancer, or induced, and could potentially lead to breakthroughs in cancer therapy by either proving or disproving a connection between H3K56ac and cell stemness.

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University of Nevada, Reno, with Dr. Deena Schmidt

Mathematics and Computer Science

The Effects of Memorization Versus Understanding on Student Performance in Undergraduate Math Course

Mathematics plays a crucial role in developing critical thinking and problem-solving skills, yet many students face difficulties in this subject. This research aims to examine the influence of memorization versus understanding on student performance in undergraduate math courses, with a specific focus on algebra and precalculus. By utilizing a mixed-methods design, combining surveys and academic performance data, the study seeks to explore the relationship between memorization and conceptual comprehension. Conducted at the University of Nevada, Reno (UNR), the research will involve administering surveys to precalculus students after each exam. Participation in the study will be voluntary, and incentives such as gift cards and raffle prizes will be provided to encourage participation. The findings will contribute to the development of effective teaching strategies and recommendations for enhancing learning approaches in mathematics courses. Adopting a mixed-methods approach, the study will collect survey data on study habits and utilize academic performance data to analyze success.

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Forensic Science Criminology*

Does Religion Affect Intimate Partner Violence on PTSD? Exploring the Role of Divine Control on Those with PTSD as a Result of Partner Violence.

Intimate partner violence is an ongoing public health issue and accounts for 15% of all violent crimes. 1 in 4 women and 1 in 9 men experience severe intimate partner violence. This can lead to injury, fearfulness, post-traumatic stress disorder, use of victim services, and contraction of sexually transmitted diseases. Research exploring the linkages between religion and PTSD has received limited attention. Data comes from the Nashville Stress and Health Study (2011–2014), a cross-sectional probability survey of black and white adults from Davidson County, Tennessee (n = 1,252). Results indicate that those with a high belief in divine control are expected to increase an individual's PTSD score. This study provides a fresh perspective on the links between partner violence and PTSD by (a) considering the effect of multiple religious variables and (b) elucidating the understudied association between divine control and PTSD. Research implications, study limitations, and directions for future research are discussed.

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Neuroscience*

Exploring the relationship between mtDNA and fatigue in a LLC Murine Model

Cancer-related fatigue (CRF) is characterized by feelings of cognitive, physical, and emotional tiredness in response to cancer and/or cancer treatment. The prevalence of fatigue is high, with some patient populations reporting as high as 99% fatigue occurrence. Inflammation has often been associated with CRF, but recent research has pointed at metabolic dysfunction as a mediator between inflammation and CFR. We propose that changes in mtDNA-cn and cell-free mitochondrial DNA (ccf-mtDNA) due to cellular metabolic dysfunction may be a biomarker of CRF. We propose to test this using the murine LLC-tumor model and cisplatin chemotherapy. Mice with or without tumors were submitted to wheel running and received cisplatin or vehicle injections once weekly for 4 weeks. Tumor and cisplatin-bearing mice showed decreased nightly wheel running with Tumor-cisplatin mice showing the most severe fatigue-like behavior. mtDNA analyses are underway.

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Education*

A National Crisis - The Psychology Behind School Shootings

School shootings have increased in the last 30 years than prior to the 21st century. From 1970- 2000, there were 707 school shooting incidents, while from 2001-2022, there were 1,510. In 2022 alone, there were 304 school shooting incidents, and in 2023 thus far, there have been 188 school shootings (<https://k12ssdb.org/all-shootings>). When they occur, people often offer suggestions that are based on emotional reactions which leads to heated arguments. More research needs to be done on potential causes of these shootings to better see possible preventions. Mental health is a large component in these shootings, and this research will include psychological and developmental research to discover whether the mass school shooters and shootings have any commonality to further determine what can be done in prevention. Many sources were analyzed during this research, such as interviews with college professionals and the police chief at MCC, databases with statistics, books with analysis of older shootings, and news articles with analysis of recent shootings. I have come to the conclusion that untreated mental health is a large component in these shootings, and if there was more access to mental health treatments, and acknowledging the problem in schools, lots of future shootings can be prevented. In the future, I would like to take the research I did with this project and research better ways to help behavioral students and at-risk students, since that is typically what the shooters were labeled in school as.

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Psychology*

What is the Cost of Childhood Poverty: A Psychological Perspective

Why is understanding the impact of childhood poverty important? Understanding this unfortunate circumstance in life is important because it has more than just a financial impact on a person's life. Poverty has a medical, psychological, and even a social impact on one's daily life, but the major concern is to be sure the person does not give up hope of breaking the cycle. To conduct this research, literature review was the main method that was used. The results of this research showed that poverty can affect not just a family but a whole community. To further this research, a suggestion to further research is to conduct qualitative research to gather personal statements of their experiences and observe the consistency with the given research on this cause. In conclusion, the purpose of this research is not to make one feel guilty or greedy but to teach others that poverty can happen to anyone.

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Psychology*

Evaluating the Behavioral and Neuroinflammatory Effects of Chronic Mild Stress in Female Mice

Unpredictable chronic mild stress (UCMS) is associated with a variety of behavioral and neuroinflammatory effects. Our lab previously failed to detect behavioral and inflammatory effects of UCMS one week following the end of stress

exposure in female mice. To determine if an effect would emerge at an earlier time point, we conducted a follow up experiment using a larger set of behavioral tests assessed immediately following stress exposure. We hypothesize that the additional depressive assessments may allow us to detect effects and that using a more acute time point would reveal neuroinflammatory changes. We will utilize a two group (+/- UCMS) design (n = 11 mice/group). We ran the UCMS protocol for approximately 3 weeks, conducting 0-2 stressors per day. We monitored activity via burrowing and sucrose water preference throughout. After 3 weeks of stressors, we evaluated depressive-like behavior. After completion of behavioral testing, the hippocampus was collected for analyses of brain inflammation.

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*University of New Hampshire, with Dr. Jeannie Sowers & Dr. Michael Cole
Political Science & International Affairs*

Iran's Power in Movement

Iran had repeatedly been in the headlines for much of 2022 due to human rights violations, discrimination of ethnic groups, and drastic regime changes. With the age of media and incoming generations, protests in Iran have been more vocal and mainstream while crossing bridges between identity groups. The 2009 Green Movement brought a new wave of modern civil disobedience under Iran's political climate, which paved the way for the 2022 protest to be widespread and contested among Iranians. This research will conduct a case study analysis on social movements in Iran from the 2009 Green Movement up until the 2022 protest, as well as the governmental responses. Conducting historical analyses and student-based interviews will provide a contrast between investigative and experienced based research. This research will aim to understand why protest continue to happen and how they have shifted in the past decade, and the approaches the government has taken to improve or worsen conditions.

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*Texas Tech University, with Dr. Oak-Hee Park
Nutritional Sciences Dietetics (NSCD)*

Is Disordered Eating Behavior an Issue College Students Face? Restrictive and Compulsive Eating Among Food Insecure College Students in a Southern University

Disordered eating behavior (DEB) involves engaging in harmful eating behaviors, such as compulsive eating, food restriction, and purging, but does not meet the diagnostic criteria for a specific eating disorder. DEB is often associated with food insecure individuals, as changes in food availability can lead to inconsistent eating patterns, including overeating after periods of food restrictions and/or participation in restrictive diets. This study specifically focuses on college students experiencing food insecurity who exhibit a pattern of food restrictions followed by compulsive overeating. Recruitment of participants for this study will be carried out among college students currently enrolled at a university in the southern region. Recruitment will involve the use of the university's e-mail announcement system and local media advertisements. To confirm the food insecurity status of participants, a validated USDA food insecurity questionnaire (10 items) will be administered. Twenty participants identified as experiencing food insecurity will be invited to participate in one-on-one interviews. The interviews will be semi-structured and guided by the social cognitive theory, with the aim of exploring the participants' behaviors, as well as personal, social, and environmental factors to gain insight into the relationship between DEB and food insecurity. All interviews will be recorded, transcribed, and analyzed using thematic analysis. The outcome of the study will serve as a foundation to generate prevention strategies and programs to reduce DEB in the college environment.

Nadia Cook, Ncook299@mail.SNU.edu
*Southern Nazarene University, Dr. Kim Rosfeld
Education*

Perceptions of Elementary School Teachers of Differences in Teaching and Learning After the Covid-19 Pandemic

This study explored public school teachers' perspectives and experiences on the differences in teaching and learning after the Covid-19 pandemic. In this study, qualitative data were collected from interviews with six teachers over Zoom. The interview questions focused on teachers' perspectives of how the classroom has changed as well as teachers' and students' social-emotional well-being as well as the students. The major themes faced by teachers during the pandemic that were found throughout the series of interviews were that having smaller class sizes helped to be able to get the content in the classroom across during the pandemic. Also, every teacher that was interviewed brought up the app Seesaw to help get video lessons and assignments to the students. Teachers reported negative effects as well with a lack of student participation and engagement, a lack of support from principals and administrators, no work-life balance, and challenges related to learning new technology.

Naomi Casanova, ncasanova22sp@ollusa.edu
*Our Lady of the Lake University, with Dr. Brittany Chozinski
Criminal Justice/Criminology, Psychology*

Are We Really Protecting the Youth?

Children who grow up in an unstable home, who are neglected and or abused, face many challenges later in life. Specifically, these children in particular are at greater risk of making poor decisions that may result in incarceration. Giving their up bringing these children are socially influenced to accept these behaviors as the norm. As a result, they follow that pathway and make a wrong call. This study aims to determine what protective factors help prevent children who have been abused or neglected to stay out of the criminal justice system later in life. This qualitative study will utilize interviews with current and former employees of Child Protective Services. Following each interview, the data will be transcribed, coded, and analyzed. The resulting data will determine what protective factors the Child Protective Service Employees believed would have a positive influence on the children's lives and prevent them from interacting with the justice system. This research will identify a variety of protective factors for consideration in future research. The identified conditions can be tested for efficacy ultimately leading to the identification of a preventative approach with the greatest change of resulting in a positive outcome.

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*Texas Tech University, with Dr. Joaquin U. Gonzales
Kinesiology*

Correlational Analysis Between Heart Rate Variability and Physical Activity: Comparing Young Adults Who Meet or Fail to Meet Published Recommended Daily Step Count

We investigated the influence of meeting the recommended amount of daily steps on heart rate variability (HRV) in college students. Thirty-four young adults (M/W: 19/15; 23 ± 5 years) were asked to wear accelerometers at the hip for at least ten wake-time hours across seven consecutive days. On the eighth day, morning HRV was measured using

3-lead electrocardiography (EKG). Heart rhythms were assessed for 10-minutes during seated rest with both feet on the ground, eyes closed, and in a fasted state. The last five minutes were used for HRV analysis to determine root mean square of successive differences (RMSSD), low-frequency power (LF), high-frequency power (HF), and LF/HF ratio. Daily steps were averaged across all seven days, and participants were categorized into two groups using the threshold of 7500 steps/day, which is recommended for adults to achieve health benefits associated with a physically active lifestyle. Independent sample Student t-tests were used for group comparisons. No differences were found between adults that met the daily step threshold (active) versus those that did not (inactive) for RMSSD (active vs. inactive: 34.9 ± 18.2 vs. 38.3 ± 19.5 ms, $P = 0.60$), LF (7.0 ± 1.1 vs. 7.2 ± 0.8 log ms², $P = 0.55$), HF (5.9 ± 1.0 vs. 6.1 ± 1.2 log ms², $P = 0.61$), or LF/HF ratio (1.9 ± 0.2 vs. 2.0 ± 0.4 , $P = 0.35$). These results indicate that HRV in young, college-aged adults is not influenced by being physically active, as reflected by total daily steps.

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Our Lady of the Lake, with Dr. Juarez
Education EC-6

Unfettered or Unsupervised internet access by minors and the connection to mass tragedies

The purpose of this research is to determine if there is a connection/correlation between unfettered and/or unsupervised internet access by minors (persons ages 3-18) who report viewing acts of violence, fatalities, pornography and/or acts of a sexual nature which caused them trauma, hurt, disturbance or desensitization to humanity. The research further explores whether this desensitization results in the ability to form connections and healthy relationships and which leads to isolation, feelings of depression, suicide–death by police shootout and thoughts of committing killings and mass injuries of students, teachers, typically at their home schools where they attended. The research results will inform educators, parents, and the overall community about the possible trauma and dangerous influence the internet can pose to minors and what can be done to help their mental health and prevent tragedies.

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University of New Hampshire, with Dr. Dean Michele Dillon
Sociology

Community Through Card Games: A Literature Review of the Current Research, Discussions, and Debates Surrounding the Culture of Tabletop Games

Over the past 20 years, scholars such as Putnam (2000) and Oldenburg (1999) have argued that community is dying. Drawing on large-scale surveys assessing Americans' participation in community-based groups and organizations such as bridge clubs, VFWs, Scouting, and more, they find that community-based groups are having lower rates of involvement, and that community-focused places (cafés, bars, etc.) are decreasing in popularity. They argue that due to the decline of these traditional sources of community, Americans today are increasingly self-isolated, as conveyed by the notion of "bowling alone" (the title of Putnam's book). Other scholars, by contrast, argue that community is not necessarily declining but changing. In their ethnographic study of players of the trading card game "Magic: The Gathering", Kinkade and Katovich (2019) found that gamers created social identities around accomplishments within the culture instead of having their identities tied to time and space. Drawing on this research literature, and with special attention to tabletop games and the culture their participants create, I conducted a comprehensive review of the literature to identify the ways in which community may be evolving in our modern era. This oral presentation

will discuss an extensive literature review of the current research on community, including debates surrounding the culture of tabletop games, with a specific focus on trading card games. I will discuss the research methods scholars use, highlight the importance of this specific field of research, and provide suggestions as to how future research may be conducted

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*Baylor University, with Dr. Elizabeth Corey
Political Science*

The New Buffalo: The Benefits and Harms of Indian Gaming

Native American tribes once found self-sufficiency by living off the land and killing buffalo. As time progressed, the tribes' capability to gain self-sufficiency has changed to where most tribes now promote their economic development, sovereignty, and strong tribal governments through tribal gaming. Thus, tribes have cultivated their "new buffalo" through the provision from the Indian Gaming Association. While tribal gaming brings advantages such as increased job opportunities and revenue; it also brings disadvantages such as problem gambling and increased criminal activity. This research uses an economic and political focus on these topics, asking what the benefits and harms are to Native Americans from tribal gaming. The first step in approaching these questions is to understand the development of the Indian Gaming Association since the passing of the Indian Gaming Regulatory Act. Next, scholarly written sources, legal documents, and interviews with contemporary figures fill out a portrait of the current situation. This research's purpose is to evaluate how tribal sovereignty and Native Americans are affected by the presence of the Indian Gaming Association in an economic and political sense. Although the results are not finalized, this research's theory is that tribal governments gain slight tribal sovereignty from tribal gaming; however, the U.S. government gains the most benefits from tribal gaming. This research suggests the need for the U.S. Government to preserve and protect the tribal sovereignty of Native Americans through tribal gaming instead of using them as pawns in the economic and political process.

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*Baylor University, with Dr. Christopher Kearney
Microbiology*

Cloning and Production of Guided Antimicrobial Peptide Detoxin-TK

The extensive use of antibiotics has led to the development of genetic resistance in bacterial pathogens. Engineered antimicrobial peptides (AMPs) have the capability to replace antibiotics, especially for gastrointestinal infections. To produce a protein commercially *E. coli* is the most common production tool, unfortunately, the AMPs kill *E. coli*. We used a SUMO carrier protein to detoxify AMPs and produce them in *E. coli*. AMP genes and primers were synthesized using an outsourced company. Primers were used to add ligation independent staggered ends to AMP genes through PCR. Ligation independent cloning into a SUMO vector was performed generating staggered ends which allowed annealing of the vector in the AMP insert. We then transferred the SUMO vector/AMP to BL21 *Escherichia coli* high expression cells, followed by induction of expression, cell lysis and isolation of supernatant. We also performed Fast Protein Liquid Chromatography (FPLC) by using a nickel affinity column to bind 6his- tagged SUMO/AMP fusion protein. The product was then analyzed on SDS-PAGE gel, and yield and purity were calculated. Our experiment will allow us

to progress by testing toxicity against a panel of bacteria in the future. The ultimate goal is to express AMP genes into *Lactococcus lactic* probiotic bacterium to permit testing in a mouse model, which will hopefully allow for the mouse to have a healthier gut microbiome after gastrointestinal infection.

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University of Texas at Arlington, with Mei-Hua Lee
Kinesiology

The Effect of Age-Related Differences and Object Properties on Manual Exploratory Behaviors in Infants

Throughout the first years of life, infants explore various object through throwing, chewing, and dropping toys on the floor. As infants age, they learn how to manipulate objects and interact with the environment around them. However, it is unknown how manual exploratory behaviors change in the first few years of life based on object properties. Hence, the purpose of this study was to examine the effect of age-related differences and object properties on manual exploratory behaviors in infants. To test this, manual exploratory behaviors were observed longitudinally in infants aged six-to twelve- months of age. The infant behaviors were captured via video cameras as they explored nine objects of different shapes (cube vs. sphere), sizes (2" vs. 4"), and textures (soft vs. hard). Datavyu, an open-source behavior coding software, was utilized to code object manipulation behaviors of reaching and grasping. Exploratory behaviors were categorized as actions involving the wrist, fingers, or transportation of the object. The results indicated that finger actions were the most common categorical action across all age groups, with transportation activities as the next recurring behavior. Object properties influenced how the infants interacted with the toys, as larger objects afforded limited ability to be transferred between hands. Overall, the video analysis revealed that infants demonstrated a wide range of manual exploratory behavior patterns. Thus, the findings from this study can serve as an indicator of the developmental undertaking involved in object exploration during the first year of life.

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Our Lady of the Lake University, with Dr. James O. Cox
Computer Information Systems and Security; Mathematics

Can Mathematical Understanding Affect Programming Ability?

Although there has been research done on the relationship between math and computer programming, there has been little to no research done on how a student's understanding of math affects their computer programming skills. Although previous research indicates that mathematical ability is said to be a reliable predictor of the students' understanding in programming (G. White, M. Sivitanides, 2003), there is a dearth of quantitative research on the topic. This study addresses their research gap by using a math self-efficacy instrument along with the student's self-reported grades in both their math and computer programming courses they have taken in order to explore this hypothesized correlation. The findings of this study can help the academic community to offer more services to help future programmers in succeeding. This study contributes to the field with more quantitative evidence to help in the decision-making process of providing support to students in programming courses

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Baylor University, with Dr. Chris Kearney

Microbiology

Repurposing of naturally-derived VK-13 antimicrobial peptide using SUMO cloning vector

Traditional antimicrobials have facilitated the development of drug-resistant bacteria, indicating a need for alternatives. Antimicrobial peptides were discovered in the 1990s and are a promising next step against super-bacteria. AMPs can inactivate pathogens by disrupting bacterial cell membranes as well as modulating immune responses. AMPs can be developed to minimize dysbiosis and harm done to the host microbiome, which is an important component of antimicrobial development. I hypothesize that the effectiveness of the AMP VK-13 can be improved by fusing it to a carrier protein, termed SUMO, which is able to detoxify and produce the AMP. AMP genes and primers were outsourced and used to create ligation-independent staggered ends via polymerase chain reactions. Annealing enabled the AMP to be inserted into a SUMO cloning vector. The engineered plasmid was then transformed into BL21 Escherichia coli high-expression cells. Cell lysis and the isolation of the supernatant will be performed in order to purify the protein using Fast Protein Liquid Chromatography and a nickel affinity column for the present 6his tag. SDS-PAGE gel will be performed in order to calculate the resulting yield and purity. Beyond these experimentations, I hope to test the peptide's toxicity towards a panel of bacteria including Escherichia coli, Pseudomonas aeruginosa, Acinetobacter baumannii, and Staphylococcus aureus. Ultimately, the result can lead to the transfer of the AMP to Lactococcus lactis bacterium to allow for testing in the mouse model.

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Texas Tech University, with Dr. Amrika Deonarine and Dr. Yuexiao Shen

Civil Engineering

Evaluation of novel cost-effective materials for groundwater contaminant removal in the rural southwest US.

In the continental United States, roughly 44.1 million people rely on water from domestic water wells. These private, decentralized water systems often do not adequately treat the groundwater and consequently, exposure to high levels of groundwater contaminants that exceed the Environmental Protection Agency regulatory limits for drinking water can occur. In the rural southwest United States, the contaminants of concern include arsenic, barium, and nitrate. The objectives of this study are: (i) to develop novel, cost-effective filters for contaminant removal using materials such as cyclodextrin, moringa oleifera seed, and milk protein, which can be used in place of more commonly used materials such as activated carbon and ion-exchange resins, and (ii) to evaluate the effectiveness of these novel materials in the removal of groundwater contaminants. Removal efficiency will be evaluated using synthetic groundwater based on groundwater composition data obtained from the USGS Circular 1337 and 1358. The groundwater contaminant concentrations will be measured before and after filtration using ion chromatography (nitrate) and inductively coupled plasma mass spectrometry (arsenic, barium). Various combinations of filter materials will be tested. Filter performance will be evaluated using removal efficiency. This is ongoing work and the results have yet to be determined, however, we hypothesize that using cyclodextrin, moringa oleifera seed, and milk protein as materials in a water filter will remove groundwater contaminants so that the Environmental Protection Agency regulatory limits will be satisfied.

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Texas A&M University Kingsville, with Dr. Robert Lockett
Social Work

Human-Animal Bonds; An Observational Study on the Relationship in Stress Levels Based on the Perspective of People Who Have Companion Pets

The purpose of this study was to identify the differences in stress levels based on the perspective of people living in the United States regarding human-animal bonds. The aim of this research was to investigate gaps in human-animal bond implementation into the social work profession. Human-animal bonds form between animals and humans through natural or ongoing interactions. The researchers conducted an online survey, shared through social media platforms, and distributed paper flyers amongst adults. Using a Likert survey design, a quantitative measure was assigned to each question, ranking the participants' experience in stress levels before and after bonding with their companion pets. The researchers hypothesized the aspect of implementing human-animal bond into the social work field as a strength-based tool could aid clients therapeutically as a supplemental component towards an established treatment plan. Relying on memory and self-report, the researchers found statistically significant differences in stress levels correlated to human-animal bonds and stress levels. Participants experienced lower stress levels after bonding with their companion pets, and reported an increase of stress levels if they did not have companion pets. The researchers identified key areas on the implementation of human-animal bond interventions lacking in social work practice. Universities and institutions could be interested in the data collected from the research for the consideration of applying the subject of human-animal bond as an interdisciplinary study in social work programs. Such application could include elective courses in the universities, to better prepare students in applying systematic approaches into the field.

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University of Texas at San Antonio, with Dr. Brian P. Hermann
Biology

Determining Function of Id4-CreERT2 through Expression Profiling and Functional Characterization

Spermatogenesis is the complex procedure through which numerous spermatozoa are generated daily within the male testis. Spermatozoa are generated continually throughout the man's lifetime are dependent on specialized stem cells located within the testis called Spermatogonial Stem Cells (SSCs). Undifferentiated SSCs are found within the gonads and can either go through a process of self-renewal to create more SSCs or differentiation to initiate spermatogenesis. Currently, there remains minimal research regarding the biological mechanism for the reason SSCs either self-renew or differentiate. Studies found that inhibitor of differentiation (Id) molecules function in regulatory roles in numerous species. It was found that Id4+ cells have a positive correlation to the number of SSCs. CreERT2 is a tamoxifen inducible, Cre-estrogen receptor fusion protein which helps researchers induce and track Id4 within the testes to correlate the number of auto renewing or differentiating SSCs. However, when transgenes are produced and genes like Id4 are genetically manipulated, it is important for researchers to validate that the Id4 gene is maintaining its original function. This is done by processing of the mRNA, DNA Genotyping and LacZ Staining of different tissues within Id4+ and Id4- mice to determine if the Id4 gene is being expressed in the tissues it would normally which are the sex organs as well as the colon. This is done to validate past and future research using Id4-CreERT2 and SSCs. The current findings are that the LacZ Staining has shown that the Testes, Epididymis and Colon are showing positive results for Id4 presence.

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Texas Tech University, with Dr. Allison Childress

Interdisciplinary Studies (concentrations in Nutrition, Psychology, ADRS)

Comprehensive Care for Substance Use Disorder: Nutrition education and culinary medicine intervention as a form of supplementary treatment for substance use disorder

Chronic substance use affects a person's nutritional status and body composition through decreased intake, nutrient absorption, and dysregulation of hormones that alter the mechanisms of satiety and food intake. There are a limited number of rehabilitation facilities utilizing comprehensive methods of treatment with a focus on nutrition. Previous research does show that there is a need for nutrition education interventions within SUD recovery settings, however, more robust study designs are needed to determine the most effective approach. Furthermore, the relationship between SUD recovery and high sugar cravings is poorly understood and it is suggested that interventions should be aligned with the Chronic Care Model as SUD is shifting from being viewed as acute disorders to chronic illnesses. The proposed nutrition education intervention includes weekly virtual meetings for 6 weeks in the Dailey Recovery Services program. The cross-sectional study will use pre-surveys and quizzes to be compared with post-intervention surveys and quizzes. These will assess for change in knowledge, symptoms from SUD recovery, and food cravings. The exclusion criteria for this intervention is those not in the early stages of recovery, which is defined as 0 to 6 months. The inclusion criteria will be adult women aged 18 to 65 who are participating in a recovery program at Dailey Recovery Services. Preliminary data should be available by the end of Summer 2023. We hope the results from the study can add to the limited amount of research on the impact of nutrition education interventions on women in SUD recovery.

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Baylor University, with Dr. Jacques Nguyen

Neuroscience

Behavioral Effects of Oxycodone and Naloxone: An Experimental Study Measuring Precipitated Withdrawal

Following the COVID-19 pandemic, prescription opioid use and misuse has contributed to the ongoing opioid epidemic in the United States, and the negative consequences of opioid addiction on public health has been exacerbated. One particular concern is the impact of opioid addiction treatment and its consequent behavioral and neurobiological outcomes. We hypothesized that male and female subjects exposed to acute oxycodone injections followed by a naloxone injection will exhibit withdrawal driven changes in anxiety-like behaviors and thermal pain sensitivity. To conduct the experiment, adult male and female Wistar rats were subjected to repeated (twice daily for 7 days) injections of saline (1 mg/kg, i.p.). Subjects were then randomly divided into three groups: High-Dose Naloxone (HDN), Low-Dose Naloxone (LDN) and a Saline Control Group (SC). Each group received a single dose of oxycodone followed by an injection of HDN, LDN or SC. An array of behavioral and biological paradigms were then used to examine consequences of repeated exposure and evaluate behavioral changes and intensity of precipitated withdrawal symptoms. The exams were divided into passive and pain-sensitive exams. Passive tests were used to evaluate anxiety-like behavior and biological changes through the use of: a marble burying test, a precipitated withdrawal scale, and total weight change. To measure tolerance, a thermal nociception test was used to validate repeated exposure to the experimental conditions. 24 hours after naloxone injection, novel subjects were placed on an elevated plus maze to further assess anxiety levels and observe locomotion.

Sarah Curfman, sarah.curfman@unh.edu
*University of New Hampshire, with Dr. Joan Beasley
Health Sciences*

Investigating the Relationship Between Medical Conditions and Emergency Service Use Among Individuals with Autism Spectrum Disorder and Mental Health Conditions

Individuals with autism spectrum disorder (ASD) experience mental health needs (ASD-MH) at high rates among those with intellectual and developmental disabilities (IDD). In addition, people with ASD experience a significant number of medical conditions and report increased emergency service use when compared to those without ASD. In this study, the relationship between medical conditions and emergency service use (including psychiatric hospitalizations and emergency department visits) within the ASD-MH population will be analyzed. It is hypothesized that people with ASD-MH who also have medical conditions will have reported greater emergency service usage in comparison to people with ASD-MH without medical conditions. This study will analyze data collected from individuals enrolled in START (an acronym of Systemic, Therapeutic, Assessment, Resources and Treatment) programs across the United States from January 2020 to December 2022. START is a national model to provide mental health crisis services to people with IDD and mental health services experiences including people with IDD-MH. Data collected from individuals with ID and individuals without ID will be analyzed separately and compared. Not all individuals with ASD have ID, which suggests that there may be differences in health outcomes between individuals with ID and individuals without ID. This study will help provide a greater understanding of the specific health challenges experienced by people with ID, particularly focusing on those with ASD, a group that is particularly vulnerable to mental health challenges. This study may also help inform the need for an integrated health approach to care.

Tamera Bishop, tamebish@ttu.edu
*Texas Tech University, with Dr. Stephen Fife
Marriage and Family Therapy, Psychology*

Healing from Infidelity: Model Development for Long-Term Couples

Infidelity is a common source of distress in romantic relationships. Oftentimes, couples experiencing infidelity in their relationship will seek therapy to work through the situation. However, there are not many resources for clinicians to use that empirically demonstrate the processes of healing for couples. This presentation will cover two studies: 1. A qualitative study using semi-structured interviews to collect data from 16 heterosexual couples (ages ranged from 19 to 46 years old) with an average relationship length of three years; and 2. A replica of the first study with couples in longer-term relationships with preference for marriage and long-term cohabitation. Data from the first study was analyzed using a grounded theory approach in order to develop a model that represented the healing process of infidelity for couples. The second study's data will be used to inform and add to the initial model, and if appropriate, provide a comparison between the healing processes for couples in shorter versus longer relationships.

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*University of Illinois Urbana-Champaign, with Dr. Jessica Montag
Psychology*

The Effect of Siblings on Language Input in the Home Book Reading Environment

Reading picture books at home provides children with linguistic experiences that may be different from other contexts. Older siblings, who are also sources of language input for younger siblings, may affect this learning environment. We aimed to understand how siblings affect linguistic environments during home book reading. Using audio recordings, we examined the differences in language produced to children with or without an older sibling present, including differences in total utterances, turn taking, unique words, and total number of words spoken. I hypothesized that families with siblings present will lead to more linguistic input from the youngest child, it will result in longer reading sessions, and they will lead to greater input from caregivers. We found different books facilitated different amounts of speech and measures of child-caregiver speech when a sibling is present is in a similar range as when a sibling is not present. Overall, linguistic input may or may not have an effect on language input during at home reading. Although the sample size was insufficient in determining significant effects, this form of research is complementary to correlation studies regarding siblings and can indicate potential patterns. Further research will encompass expanding the sample size, as well as the demographics of the participants. Additionally, I would like to evaluate the speech of siblings regarding their linguistic measures in comparison to the target child and other conversational components, such as, complexity of their speech.

Thomas Schnaible, thomas.schnaible@ttu.edu

*Texas Tech University, with Dr. Jason Tham
Musical Theatre / Psychology*

A Qualitative Examination of Mental Models of Users in Virtual Reality Experiences

This study strives to evaluate and document the experiences of users of varying levels in accomplishing Virtual Reality tasks. Individuals utilize mental models to inform their decisions when approaching various problems. These mental models are developed through prior lived experiences and interactions with their environment. With little qualitative research in this area of study, understanding exactly what users think when placed in a virtual environment will inform a better understanding of how to create an intuitive and overall enjoyable experience. Trials will begin in fall utilizing think-aloud testing and a semi-structured interview. Users will express their thoughts, feelings, and mental models while engaging in Virtual Reality tasks. Tasks will be selected from a variety of games or experiences offered on Steam VR, Meta Quest 2, or PlayStation VR. It is hypothesized that users will rely heavily on their physical experiences and struggle to interact with virtual objects and navigation in the environment. Further predictions include confusion and/or overwhelming stimuli resulting in stress and dissatisfaction with their experience. This information will help create a foundation in which others can investigate comprehension and learning in a Virtual or Mixed Reality space.

Tristain Lewis, tlewis1031@mail.snu.edu
Southern Nazarene University, with Dr. Scott Drabenstot
Psychology

Intersectional Marginalized Identity

It is crucial for students, especially minority students, to have a sense of belonging at their university. Students do not find belonging at universities, the result of this dilemma is transfer rates increasing and student retention decreasing. This paper evaluates the influence that affinity and/or race groups have on belonging and hope for minority college students at a Predominantly White Institution (PWI). Using the twin lenses of intersectionality and Relational Cultural Theory we test the hypothesis that affinity groups based upon race or gender will allow for all of a student's identities to be embraced and accepted. Participants, at a small PWI, were assessed for belonging, trait hope, and demographics as a part of a larger study on hope. While the difference did not attain statistical significance, there is a trend toward difference. The results also indicated that, for the sample studied, individuals who are in affinity groups report lower levels of belonging. This suggests that individuals who are experiencing a lack of belonging may be seeking out gender or race/ethnicity-segregated groups to increase their sense of belonging at PWIs.

Wendy Diaz, wdiaz@mail.snu.edu
Southern Nazarene University, with Dr. Scott Drabenstot
Psychology

Are Pell Grants Enough?

This study aims to examine how gender differences and socioeconomic status influences how each individual experiences a sense of belonging and hope. Using the lens of attachment theory, this study focuses on the sense of belonging and hope among Pell Grant recipients. It is hoped that this will assist the search for ways to increase belonging and hope on campus. This research will add to the discipline of psychology a better understanding of the factors that can potentially impact a sense of belonging and hope in an individual. Data was collected through an online survey that measured undergraduates' levels of belonging and hope and collected demographic information. The results showed that, for this sample, receiving Pell Grants has no correlation with belonging and hope. However, the results did show that gender has a significant impact. It can be concluded that women attending this institution tend to have a lower sense of belonging and hope in comparison to men. The results also showed how students living on campus were more likely to experience belonging and hope in comparison with those who don't live on campus. Implications for this are discussed.

William Lento, willjlento@gmail.com
University of Nevada, Reno, with Dr. Justin Gifford
English Literature

Reading the 20th Century as Liminal Space in the Early Writings of Joan Didion

A reading of several early works written by American author Joan Didion, with an emphasis on liminality theory and cultural context, will provide readers with an expanded perspective on how culture transitions between significant periods and how literature allows for such transitions to be observed. Liminality is a branch of literary theory that attempts to analyze cultural practices, codes, rituals, and meanings in-between aggregate structures and uncertain outcomes (Horvath et. al.). Conducting this research involves performing a close reading of the primary texts as well as primary source documents and supplementary scholarly articles concerning both liminality theory and previous scholarship on Didion's works. Completion of this research is expected to provide readers with a novel perspective from which the works of Joan Didion may be read and interpreted from a standpoint that emphasizes the interrelatedness of culture and literature. Not only does this work allow for the concept of liminality to be integrated into literary discourse in a new manner, but close analysis of the works of Joan Didion continues to offer readers a unique perspective on the twentieth century and how transient or liminal periods function in the scope of cultural and literary studies. Following conclusion of this study, future researchers may reference the work done here in order to further apply theoretical frameworks to the works of Joan Didion and her contemporaries for the purposes of understanding their cultural significance. Additionally, using liminality in this novel approach may prompt further use of the theory in similar texts.

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Baylor University, with Dr. Mary Lauren Benton
Biomedical Engineering/Bioinformatics

GeneRegulate Tool

Gene regulatory elements, such as enhancers and silencers, play a significant role in regulating the degree of gene expression. Identifying these regulatory elements can provide a great understanding of how genes are expressed differently across different tissues and offer possible therapeutic targets for precision medicine. Understanding the regulatory landscape that controls gene expression is important in advancing precision medicine. GeneRegulate solves this need by connecting enhancer and silencer data with gene expression, to gain a better understanding of the key regulatory components that are associated with tissue-specific expression. Our tool allows researchers to analyze complex genomic data across 6 human tissues. GeneRegulate offers two options: users can upload their own gene lists, enhancers, and silencers or use our preloaded datasets. We process the data in Python, connecting regulatory elements with their associated genes using an existing set of chromatin loop annotations. GeneRegulate users can easily analyze regulatory landscapes for individual genes across multiple tissues, displaying the result with a variety of data visualization options, enabling researchers to easily identify tissue-specific expression patterns and regulatory trends. GeneRegulate proves to be a powerful tool for studying gene regulation and tissue-specific expression. Analyzing these data can increase our understanding of regulatory mechanisms, with potential implications for precision medicine and drug development. As GeneRegulate evolves, our goal is to add more genome data and analyze more regulatory elements. By doing this, we aim to uncover new findings in gene regulation and contribute to the advancement of precision medicine.

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University of Montevallo, with Dr. Bart Pitchford
Theatre

Defined Space: Creating an Experience

The world is constantly implementing technology into the workplace, leisure, and education. The use of Virtual Reality is used to submerge participants into an escape from the world. For many during the pandemic in 2020 this technology provided some normalcy. However, three years later, society is getting reacquainted with the idea of in person interactions, public sporting games and maskless indoor spaces. The use of Augmented Reality (AR) is a returning approach to exploring the world, as this technology does not completely submerge a participant into a cyberworld. Instead, AR allows participants to stay grounded in reality with a few virtual tweaks. AR started off as a technology of science fiction, and it's now one of many highly used technologies for engaging people in schools, entertainment, and advertising. If AR has success in areas such as education and how knowledge is illustrated in places like the Alder Planetarium, can AR enhance and improve a live theatrical production? Thus, the purpose of this research is to examine the viability of augmented reality in theatre. This process is exploring AR used as an aesthetic and service through methods of AR glasses and Smartphone apps in four case studies. These include AR glasses in the Wizard of Oz, AR app in Elements of Oz, GalaPro app with captioning on smartphone in Escaped Alone and highlights of AR glasses with captioning. In addition, this research investigates some obstacles that AR faces in theaters and its contribution for further accessibility and entertainment.

Ynes Ineza, yineza@ttu.edu
Texas Tech University, with Dr. Abdul Serwadda
Mathematics and Computer Science

Exploring ChatGPT's Capabilities in Discrete Math

An increasing volume of research across various domains is currently investigating the capabilities of ChatGPT. In our study, we aim to delve into both the performance and confidence levels of ChatGPT with regard to understanding and problem-solving within the realm of Discrete Mathematics (DM). DM serves as the cornerstone for a multitude of courses across engineering disciplines such as Electrical and Computer Science. To structure our experiments, we employ a dataset derived from 'Discrete Mathematics and Its Applications,' authored by Kenneth H. Rosen. This textbook is widely recognized as a standard resource for DM courses across numerous universities, both within the USA and globally. We present each problem to ChatGPT five times, and the consistency of the generated solutions serves as a measure of ChatGPT's confidence and understanding. For validation, we compare the AI-produced solutions against those provided in the textbook. This methodology enables us to pinpoint areas where ChatGPT manifests varying degrees of confidence in solution generation. Our initial findings indicate that ChatGPT demonstrates confidence in approximately half of its responses, based on five attempts per question, and provides accurate solutions on the first attempt approximately 53% of the time. Such insights pave the way for future research aimed at bolstering ChatGPT's performance, ultimately enhancing its utility for individuals seeking knowledge, especially in the realm of Engineering.

POSTER ABSTRACT PRESENTATIONS

(In alphabetical order as submitted)

Agustin Perez, agustin.perez@students.tamuk.edu
Texas A&M University-Kingsville, with Dr. Xiaoyu Liu
Electrical Engineering

Retrofitting Existing Residential Buildings with PV Systems to Achieve NetZero Energy in Humid, Sub-Tropical Climates

The conversion of existing residential buildings into Net-Zero Energy Buildings (NZEBS) promises to offset a substantial portion of total U.S. greenhouse gas emissions. However, there are significant challenges to address regarding the amount of energy produced by green energy sources and the amount of energy consumed by existing residential buildings. This study makes an important contribution to the literature by simulating possible PV or PV/T systems for retrofitting existing residential buildings. The purpose of this study is to develop a cost-effective solution for retrofitting existing residential buildings with individual PV systems to achieve net-zero energy in humid, subtropical climates by simulating how different PV systems operate in a simulation. The independent variable will be defined as the amount of energy produced by various PV systems and the amount of energy consumed by energy-efficient technology used to retrofit existing buildings (i.e. added insulation, replacing HVAC, installing energy efficient appliances, etc.). After reviewing the current literature on NZEBs, the methodology involves analyzing empirical data related to residential buildings then utilizing Building Energy Optimization Tool (BEopt) software to simulate existing residential buildings' energy production, consumption, and efficiency with the goal of optimizing them to achieve a net-zero energy production/consumption balance. Once simulations are complete, a cost-effective retrofitted NZEB solution can be proposed, specifically for humid, sub-tropical climates

Aleiyah Fields, aleiyah.fields@okstate.edu
Oklahoma State University, with Dr. Ashley Cole and Dr. Lucia Ciciolla
Psychology

Analysis of the unique challenges of Native Americans growing up on reservations

To date, there is little research regarding Native Americans living on reservations and the challenges they may face. When you compare common issues like poverty and substance use, the rates can be higher in Native American communities. To examine the challenges such as ACEs, poverty, and substance use with Natives on reservations, I used the following search engines: Google Scholar, Scopus, and PsychINFO. The key search terms used were Native Americans, American Indians, Alaska Natives, indigenous, reservation, reservations, reserve, ACEs, adverse childhood experiences, poverty, substance use, substance use disorders, alcohol, and drug use. Many sources found that ACE scores, poverty, and substance use were much higher in Native Americans on reservations compared to other populations. Research also shows challenges like ACEs, poverty, and substance use have a significant impact on the lives of those who experience them. Future research should include treatment options for Native American community that are culturally inclusive.

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*University of New Hampshire. With Dr. Ngozi V. Enelamah
Social Work*

Mental Health Symptoms and the likelihood of Masking Behaviors Among College Students

Higher education can be a taxing period for many young adults due to the academic and social pressures that often appear on college campuses. Social pressures and or stigma from mental health challenges can result in negative coping mechanisms and increased adversity for students. A coping mechanism that has been linked to stress and mental health challenges is the act of masking or camouflaging where individuals consciously or unconsciously attempt to compensate through certain behaviors or traits in order to adjust to general social norms. This study aims to examine the association between the mental health symptoms of college students and the likelihood of engaging in masking behaviors. Specifically, the study will examine to what extent mental health stigma is associated with camouflaging behaviors among college student. The study will use a mixed-methods research methodology to gather and analyze primary quantitative and qualitative data from college students at a university system in New England. Specifically, a convergent parallel design where quantitative data is compared and related to qualitative data will be used. This study is significant as it will shed light on the incidence of camouflaging on college campuses. Findings may help inform strategies to reduce stigma, promote understanding and acceptance, and assist colleges and universities to create a welcoming and inclusive environment for all students to thrive both academically and socially

Ashley Maldonado, Amm21gj@sulross.edu

*Sul Ross State University, with Dr. Jamie Boyd
Animal Science with Equine focus*

The impact of exercise on blood metabolites and other health parameters during the reconditioning period of emaciated stock type horses

In the last decade there has been minimal research on the reconditioning aspect of emaciated horses that have gone through rehabilitation. The purpose of this study was to analyze how exercise affects the stress level of recovering emaciated horses during rehabilitation. This study was conducted from April to June 2023 at Sul Ross State University to evaluate the effects of progressive exercise on blood lactate, respiratory rates, heart rates, and body temperature. Data was collected during the last eight-week portion of a 20-week recovery study in which these horses were rescued, rehabilitated, and reconditioned. Measurements were taken at week 12, 16, and 20 pre and post exercise. Blood was drawn as well as lactate and health parameters were measured while the horses were resting and was repeated at 0, 5, and 15 minutes post-exercise. The exercise period progressed from 15 to 75 minutes on a Priefert walker during the study period as the horses conditioning increased. Ten horses were used for this project and were exercised five days a week with two days for rest each week. While data is still being analyzed, early results have indicated that horses were not stressed during the workouts based on recovery times and lactate levels.

Ashlynn Main, Ashlynn_Main1@baylor.edu

*Baylor University, with Dr. Ashley Barrett
Communication*

Compassionate Healthcare and Marginalized Patients

There has been a growing focus and need on the examination of compassionate communication in healthcare. Many marginalized patients have experienced uncompassionate care from physicians in healthcare visits. Under my mentor's project, we are examining how compassionate healthcare relates to serving marginalized and underserved populations. The research questions of the study is to discover how providers can better suit marginalized patients and in what way. Additionally, how is marginalized-patient care different from non-marginalized patient care? The focus of this project was to conduct a survey of the academic literature on the research areas of compassionate literature, marginalized healthcare populations, and how best to serve marginalized patients. The purpose of the literature review was to discover the extant, current literature on compassionate and marginalized healthcare populations, what methods have been implemented to help serve marginalized patients, and on compassion and organizational communication. Results from this review suggest that it is difficult to implement a more structured approach to compassionate communication in healthcare as it needs to be implemented by an organization. However, there are ways to ease this structural transition such as compassionate communication training or models that allow physicians to move towards a more compassionate shift when communicating to marginalized patients in particular. The insights from this literature review can serve as a valuable resource to see the different methods being discussed for implementing compassionate communication in healthcare. Moreover, the insights from this review can be used in an initial research proposal.

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*Baylor University, with University of Michigan SROP, Dr. Joseph Potkay
Biomedical Engineering*

Designing, Processing, and Validating the Functionality of 3D Printed Artificial Placenta Drainage Cannulas

There are approximately 25,000 extremely low gestational age newborns (ELGANs) and 80,000 premature infants born each year that risk death and disability. The artificial placenta (AP) research project aims to help support ELGANS and preemies by recreating the fetal physiology through extracorporeal life support. In order to properly regulate the blood flow within the AP, drainage cannulas are needed. For this study, the 3D printing approach to manufacture was explored. Building off of previous models of cannulae, the current study involves an ovular cross-section as opposed to circular, proving to resolve recurring issues of cannulae splitting and collapse. It was found that this is mainly due to design and the print grain pattern. To collect data, cannulas were water and blood tested using a continuous flow pump, simulating the blood flow inside an ELGAN lamb. Currently, results show that the ovular geometry has reduced the occurrence of splitting and collapse due to negative pressures. This development is what ultimately led to the advancement of the project moving onwards to blood flow testing. With the current 3D printed 6fr cannulas, advancements have been made in the research of artificial placenta in developing a reliable form of manufacturing this device. The 3D printed approach also offers variety to better accommodate patient needs. Given this device is to be used in-vitro, it will need further testing and preparation for biocompatibility so they can be inserted into the body without risk of infection or other complications.

Azana Best, azana_best1@baylor.edu
Baylor University, with Dr. Sarah Kienle
Biology

Comparison of stable isotope analysis values of various leopard seal tissues

The rapidly changing climate is causing a shift in the ecosystem of the Southern Ocean. Leopard seals (*Hydrurga leptonyx*), are apex predators of the Southern Ocean that heavily control the structure of the Southern Ocean food web. Leopard seals are one of the least studied apex predators on Earth, due to their remote habitat, solitary nature, and aggressive behavior. Researchers opportunistically collect samples from leopard seals to study their diet (stable isotopes; bulk nitrogen and carbon), leading to a variety of different types of archived samples. However, the comparison of these tissues and how well they represent the individual's diet is unknown. Our objective is to compare the isotopic composition of each tissue to further inform us on leopard seal diet and similarities and differences between the tissues (whiskers, hair, blood, claws, blubber) from the same individuals. The isotopic measurement of several tissues from the same individual can provide short-, intermediate-, and long-term dietary information. Our preliminary data shows an association between two very distinct tissues, blood and whiskers. Additionally, we investigated the variation of nitrogen and carbon isotopes along the length of whiskers, providing important base-line information on the variance in isotope values from seals feeding on heterogeneous diets. Our next steps are to analyze the isotopic composition of the remaining tissues and assess the variation between the tissues based on their different turnover rates. These results will allow more accurate dietary reconstructions on the basis of isotopic analysis of the tissues of seals and other marine mammals.

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Oklahoma State University, with Dr. Juliana French
Psychology

A Longitudinal Investigation of Factors that Contribute to Marital Quality and Stability: The Oklahoma State Newlywed Project

Maintaining high-quality long-term relationships, such as marriage, is strongly associated with overall better well-being and health, including both physical and mental health. Thus, advancing theory and knowledge on how couples maintain satisfying relationships is important. The Oklahoma State Newlywed Project is an ongoing dyadic, community-based, multi-year longitudinal study of marriage that, broadly, aims to understand factors that can explain different trajectories in marital satisfaction. That is, why do some couples begin their marriages less satisfied than others? And why do some couples remain satisfied over time whereas others do not? To this end, we are actively recruiting newly married couples to complete a multi-phase study that includes (a) an intensive baseline survey assessing couple members' personal and relationship histories as well as myriad individual difference variables, (b) an in-person laboratory session, during which we collect hormonal samples and observational video-recorded data of spousal interactions, (c) two-week long daily diary surveys assessing daily relationship and personal experiences, and (d) four-month follow-up surveys spanning the first two years of marriage, including measures of relationship quality (e.g., satisfaction, commitment). Because recruitment and data collection is ongoing, results are pending. Nevertheless, utilizing these complex methods, we will be able to glean insights into how factors such as attachment, stress, and even hormones may influence long-term relationship quality and stability.

Brooke Manuel, bnm21ye@sulross.edu

*Sul Ross State University, with Dr. Sidney Balman Jr.
Journalism*

America's Shame: The Silent Tragedy of Indigenous Women

Indigenous women have been facing a crisis of violence for centuries now. According to crime statistics, more than half of the total population of Indigenous women has been sexually assaulted, more than half of the population has been subjected to domestic abuse, and in comparison to all other ethnicities, Indigenous women are ten times more likely to be murdered. Due to the fact that Indigenous people make up only 2% of the total United States population, these statistics are alarming. This crisis dates back to European colonization when the murder and sexual abuse of Indigenous women was used as a strategy of genocide. Prior to European colonization, Indigenous women were vital to the survival of their Tribal communities, which is one reason why they were initially targeted by European settlers. Nowadays, law enforcement agencies do not put the same resources into cases of sexual assault, domestic abuse, and violence against Indigenous women as they do for cases against other ethnicities. This research aims to bring awareness to the crisis that Indigenous women are currently facing, answer the question of why these criminal offenses are not given the same priority as others, and offer potential remedies.

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*Baylor University, with Dr. Julie Holcomb
Art History*

The Decolonization of the African Collection from the Martin Museum of Art

This research project aims to study the provenance and ethical practices used during the creation of the Martin Museum's Permanent African Collection and connect their current practices to museums worldwide. The first part of the project focuses on the museum's creation, the formation of the African Collection, and its provenance. The second part of this project focuses on three objects from the Martin and addresses contemporary museum topics related to each piece. Issues discussed in this project's second half include colonization's impact on African art, tourist objects and their authenticity, and the decolonization of museum spaces. This research is important because museum ethics have evolved immensely since the 1970s when most of the African Collection was acquired. Furthermore, the Martin Museum and other institutions have begun addressing ethical issues arising from their permanent collections to decolonize their spaces. This project required a mix of archival research, library research, and research on museum policy. This study uncovers ethical problems from the past but also shows a positive change in institutional practices today. This project concludes by discussing what Martin Museums is doing to prevent ill practices in the future and how their reflections on past actions make them better institutions today.

Camryn Medina, cxm19qc@sulross.edu
Sul Ross State University, with Dr. Shanna Moody
Kinesiology (Exercise Science)

Trends in the Baseline Health Status of College Students in a Rural, Division III University

In Spring of 2022, approximately 15 million students were enrolled in an undergraduate college program in the United States (Welding, 2023). Of those students, it is estimated that one in three are considered clinically obese (Yashi, 2022). Obesity is the largest contributing risk factor to lifestyle related diseases like hypertension, coronary heart disease, and type II diabetes which include metabolic syndrome. Recognizing there is a lack of data pertaining to the clinical baseline health amongst college students poses an elevated risk in developing metabolic diseases at an earlier stage of their lives. This study is a response to the lack of peer-reviewed data about the baseline health of college students in a rural division III university. The purpose of this study was to assess obesity risk along with physical activity, blood pressure, oxygen saturation, glucose and lipid levels in college students. Through a Contemporary Health Problems class (KINE 3334), student researchers collected data on a rural, DIII college campus through convenience sampling of students over a three-week period. Student researchers were trained in data collection through the course. All participants completed a digital informed consent agreement prior to sample collection. Data was organized and analyzed after collection using statistical software. Through the interpreted data, this paper aims to bring awareness to students and the public about the health of college students, determine the level of risk of metabolic disease in college students, and serve as a foundation for health promotion programs in college and to stimulate future research.

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Oklahoma State University, with Dr. Audrey Gramling
Accounting

Tax Software and Its Usefulness: Is there room for Refinement?

My research will involve trying to find out whether the software used in the accounting industry is effective and productive for accountants, who are actively relying on such software in their day-to-day tasks. This is the following question I intend to answer about accounting software: Is there a need for refinement or changes to tax software used by industry professionals? The components that could be looked upon are overall performance, likes/dislikes, and user feedback. If the current software being used is found to need help with improvements, the efficiency of accountant duties can be increased. The amount of time and energy spent by accountants is vast, due to the nature of many accounting duties. Relieving some of these duties with the addition of adequate software can improve the daily life of accountants at work, allow for more time to be spent on other matters, and reduce the stress of accounting duties. I will find out by using an online survey, which will be developed using Qualtrics. The software I intend to analyze is professional Tax Software, such as Drake Tax. These questions will be focused on the general performance, likes/dislikes, and user feedback about the software's compatibilities. This accumulation of data will help toward the answer of whether there is a need for refinement or changes to tax software, used by industry professionals.

Carissa Fong, carissa_fong1@baylor.edu
Baylor University, with Dr. Mary Lauren Benton
Bioinformatics

Predicting Gene Expression in *S. cerevisiae* From Random Promoter Sequences Using Machine Learning Methods

Phenotypic variation in eukaryotes is largely determined by gene regulation. While the protein-encoding areas of the genome are responsible for creating the compounds that result in a specific phenotype, the regulatory regions of the genome add further complexity that determine the observed phenotype. One such region is the promoter, which is critical for the expression of all genes. However, the "regulatory code" of the promoter -that is, how its sequence relates to the expression level of its associated gene -is not very well understood. In the present study, we aim to obtain a better understanding of the relationship between a promoter's sequence and strength by utilizing machine learning methods to predict the level of gene expression from a yeast promoter sequence. We also compare the performances of various machine learning algorithms to determine the optimal strategy for predicting gene regulation. We find that the models trained on 3-mer data performed decently well in both classification (accuracy= 0.69, FI = 0.69) and regression (RMSE = 1.95, R2 = 0.32); however, there is still much room for improvement. In the future, we plan to test nonlinear models such as neural networks to determine if they are better able to capture the relationship between sequence and expression. We also hope to train and test our models on a more powerful machine to improve runtimes and enable the use of larger datasets. Further research is needed to uncover whether models trained on yeast promoters can be extrapolated to other organisms, including humans.

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Texas A&M University-Kingsville, with Dr. Jeffery Chernosky
Political Science

Factors Influencing High-school aged Student Success: An Exploratory Case Study of a Rural South Texas School District

Minimal research has been conducted regarding the success factors associated with high school students in rural school districts, leaving a gap in our understanding of the elements that influence students' academic, technical, and life success. The purpose of this study was to identify factors that contribute to the success of juniors and seniors enrolled at San Perlita High School. This study utilized a mixed methods design, which involved the collection of qualitative data first and then quantitative data. Researchers accessed public records of the Texas Education Agency (TEA) to examine the relationships between juniors and seniors at San Perlita ISD and other juniors and seniors in the same Education Service Center (ESC) Region One. A holistic approach was implemented during the semi-structured personal interviews to assess student's perceptions of support systems and the campus environment. The results of this study aimed to benefit the San Perlita school district by informing faculty, staff, and students of factors that may contribute to student success. The results of this study may be applied by educators and the community within districts of similar size, composition, and TEA classification to achieve higher levels of student success and accomplishment in their own communities.

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Texas A&M University of Kingsville, with Dr. Timothy Oblad
Psychology

Facilitation of Emotional Expression in Men

There is a popular belief that women tend to be more emotionally expressive than men. However, gender differences in emotional expression could be traced to cultural practices or expectations that are upheld for men. In this study, it is acknowledged how restrictive expressivity and perceived social support could play a part in the development of alexithymia in adult men; having difficulties in identifying, describing and expressing emotions. The purpose of this study was to better understand how to facilitate men's ability to express their feelings and confide in others. This was achieved by collecting quantitative measures of alexithymia, emotional expression, perceived social support, and qualitative information about an experience from men's lives through an online survey. Findings helped support the significance that social support had on mitigating the development of alexithymia traits. Correlations were also found between alexithymia and emotional expressivity scores. Common themes of men's emotional expression will also be discussed. The pursuit of this study assisted in gaining insight into how men would feel encouraged to reach out for help or support to prevent the negative effects of the cultural perception of "masculinity."

Corey Bradley, corey.brannon@okstate.edu
Oklahoma State University, with Dr. Jonathan Coley
Sociology; Gender and Womens Studies

Pro- and Anti-Transgender Legislation in U.S. State Legislatures

Transgender legislation has become prevalent in the last few years. This legislation rules on whether transgender individuals deserve the same rights as "normal" individuals. Many people believe that being transgender is a "sin" or even a mental illness, which leads them to oppose granting a transgender individual the same rights as someone who does not experience gender dysmorphia. This project will examine the types of bills related to transgender issues that were proposed in 2021 through 2022. The project will detail the aspects of the bills and illustrate whether they are Pro- or Anti- transgender. While working with an advisor on this project we selected one state from each major region. For this project, we have selected one blue state (California), one red state (Oklahoma), and two swing states (Pennsylvania and Wisconsin). In California, the proposed bills were usually very inclusive for transgender and gender-nonconforming individuals. We noticed the same inclusivity within the state of Pennsylvania. While on the other hand, we can see that Oklahoma and even Wisconsin have had a history of proposing bills that are exclusionary of not only the Transgender community but also the LGBTQ+ community. We hope the findings of this study will assist future researchers in bringing awareness to this issue and strive to promote change so that individuals can self-govern and exercise their full rights.

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*Baylor University, with Dr. Kelsey Ragan
School Psychology*

Do Motor Skills Matter? Using Written expression through CBM

In the United States, one in 36 children has been identified with autism. Children with autism often experience delays in communication in forms of non-verbal, verbal, and written. (CDC, 2023) Students in the education system use writing as a crucial part of their learning and understanding of the real world, which attributes to their identity as a whole. (Himmah et al, 2022) Students with ASD[GR1] are also assessed in the education system through a form of Curriculum-Based Measurement (CBM) Students with Autism Spectrum Disorder (ASD) have been shown to have lower scores in their WE-CBM. In this study, handwriting samples were coded from 10 elementary school students; 8 male and 2 female (50% White, Non-Hispanic/Latino n=5, 50% Hispanic/Latino n=5); participant ages ranged from 5-11 years old. These students were given two minutes to write from a prompt. These samples were then assessed through the Handwriting Legibility Scale (HLS) and double-coded to achieve inter-rater reliability. The purpose of this study is to identify and gain a better understanding of the potential impact of handwriting assessments of students with Autism. The question guiding this research project is, "How can these students be accurately assessed through their written expression in CBM standards if they have handwriting impairments that may hinder their results?".

Daniel Jones, troy.jones@students.tamuk.edu

*Texas A&M University-Kingsville, with Dr. Matthew L. Alexander
Chemical Engineering*

The Effects of Nitrate and Phosphate Starvation on *Dunaliella salina* and *Scenedesmus obliquus* Biomass Composition

As traditional fuels begin to run out, alternative fuels become a necessity. Renewable biofuels are especially appealing due to their compatibility with current infrastructure. The purpose of this study is to analyze two microalgal species, *Dunaliella salina*, and *Scenedesmus obliquus* that appear highly promising for use as a biofuel feedstock. A quantitative approach will be used to analyze fluctuations in useful biomass production that occur under nutrient scarce conditions relative to cultivator recommended growth conditions which will act as a control. Each species will be subject to nutrient deprivation. Specifically, each species will be deprived of nitrate and phosphate separately. The percentage of lipid and carbohydrate biomass per dry weight gram will be measured and compared to growth rates to determine useful biomass productivity. The data collected from this study will aid future experimenters in the optimization of their microalgal experiments, and it will help engineers looking to create a plant or process for refining microalgae into biofuel. It is expected that both lipid and carbohydrate production will increase during the beginning days of nutrient deprivation, but over time a decrease will be noted.

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*Sul Ross State University, with Dr. Laura Patterson Rosa
Animal Science*

Using Genetics to Trace the Ancestry and "Breed-type" of Rescue Horses

In the United States, horses (*Equus caballus*) are used in sports, as pets, and for work, but not for human consumption. Yet, yearly, roughly 200,000 unwanted horses are deemed for international slaughter. There is also a lack of information about the demographics of unwanted/abandoned horses, aside from not being marketable, being disabled, infirm, unattractive, dangerous, or lacking athletic ability. Adding value to these horses may allow for better placement, especially for these individuals. Because horses with known lineages and breed are usually more valuable and sought after, knowing "breed-type" and relationships may support adoption or rescue. Our goal was to evaluate the genetics of local rescued horses of unknown history and trace back their genetic ancestry to determine likely breed and kinships, using a commercial genetic testing service (Etalon INC, Menlo Park, CA). Pulled tail hair bulbs were submitted for genotyping using the Ancestry panel. Eleven individuals were evaluated for genetic ancestry composition and compared to the client database of Etalon Diagnostics to determine possible kinships. We expect that by assigning ancestry, possible related breeds and kinship, we will have a better understanding of the diversity of individuals deemed unwanted, as well as increase the likelihood of adoption after rehabilitation. Resulting data may support genetic testing procedures to determine ancestry and kinship, adding value to unwanted/abandoned horses deemed for slaughter. By determining a "breed-type" or relationship, we can better evaluate epidemiological aspects of unwanted horses deemed for slaughter.

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*The University of Texas at San Antonio, with Dr. Alan Meca
Psychology*

Exploring the Power of Identity: Political Engagement among Latino and Hispanic College Students

This study aims to explore the relationship between Ethnic/Racial Identity (ERI), U.S. Identity (USI), political involvement, and civic engagement among Latino and Hispanic college students. By investigating the exploration, resolution, and affirmation factors of the ERI and USI (Umaña-Taylor, 2014), we can observe the influence of political involvement of Hispanic/ Latino college students. With this study, it is possible to tackle the limited research that exists on the intersection of these identities with political engagement. By examining the correlation between ERI, USI, political involvement, and civic engagement, this study aims to shed light on the potential moderating effects of these identity dimensions. The historical context of student activism, such as the Chicano Movement, demonstrates an impact towards collective action and community involvement in political change. Previous research suggests that civic engagement and political participation may be influenced by shared community ties, skills gained through participation, and personal experiences of discrimination (DeSipio, 2002). By understanding the relationship between ERI, USI, political involvement, and civic engagement this paper should provide valuable insights into the motivations and aspirations of Latino and Hispanic college students. This research seeks to shed light on the gap in the literature and offer guidance for future studies exploring the power of identity in shaping political engagement and civic participation among this population.

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Texas A&M University Kingsville, with Dr. Humberto Perotto
Agricultural Science

Quantifying Cattle Movement through Identified Pastural Trails using Unmanned Aerial Vehicles

The purpose of this study is to quantify livestock in a pasture by identifying cattle trails using unmanned aerial vehicles (UAVs). The UAV was sent on a pre-programmed route, to collect one image per second, and obtained a total of 1,320 images. The orthomosaic constructed by images obtained from unmanned aerial vehicles were used to stitch, with a mean reprojection error of 0.229, the 95.5-hectare pasture from our study site. Our objectives are to 1) identify the characteristics distinguishing walking paths and grazing trails in relation to vegetation availability, 2) determine the density of the cattle trails and the proportion of heavily used trails and 3) interpret the data to develop the interconnected relationship between the disturbance of pastoral livestock and resource availability. The findings of our study will contribute additional research towards understanding the relationship between cattle mobility and resource availability. Identifying the relationship is needed in order to implement better land management techniques and biodiversity conservation of our agricultural landscapes.

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The University of Texas at San Antonio, with Dr. Daniel I. Pineda
Mechanical Engineering

The design and testing of a rhodium-based catalytic reactor for the experimental investigation of decomposition using laser absorption spectroscopy

Hypersonic test ground facilities accurately simulate high pressures and velocities but lack the capacity to simulate gas flow at high-temperatures due to thermal-structural material limitations. This necessitates the need for injection of high-enthalpy gases into hypersonic test ground facilities to model complete high-speed fluid flow phenomena. Nitrous oxide (N₂O) is a high-enthalpy gas of which naturally decomposes at high temperatures into molecular oxygen and nitrogen imitating the characterization of air in hypersonic flow regimes. Nitrous oxide also decomposes at low temperatures with the assistance of precious metal catalysts. This experimental study aims to use laser absorption spectroscopy (LAS) as a proof-of-concept advanced diagnostic technique for the measurement of high-temperature catalytic nitrous oxide decomposition conversion efficiency inside a N₂O catalytic gas flow reactor. Nitrous oxide decomposition at low temperatures will be initiated with the use of a catalyst consisting of cylindrical pellets comprised of rhodium supported on alumina. Data acquisition will consist of measuring N₂O decomposition concentration and recorded thermocouple data from inside the catalytic gas flow reactor at varying mass flow rates. Expected results would reveal near-elimination of N₂O at moderately high temperatures from the exhaust of the catalytic reactor and the presumed presence of hot molecular nitrogen and oxygen. Experimental results from this study can be applied towards improving the design and development of catalytic gas flow reactors and hypersonic ground testing facilities to fully model the characterization of high-speed fluid flow regimes as well as propel further study of using N₂O as a monopropellant for space applications.

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Oklahoma State University, with Dr. Bree Baker
Exercise Science

Composition Changes Across Seasons and Injury Risk in Softball Athletes

Physical activity and participation in sports have been well documented in their effects on bone and body composition in female athletes. Furthermore, differences in body composition measurements have been recorded between females due to specific physical requirements for the sport of choice (Peart, 2019). Across the literature, body and bone composition analysis in softball athletes takes many forms. Typically, studies range from singular season composition analysis to multi-season compositional analysis. With interest in analysis across multiple seasons, there is limited data on body composition changes across seasons. The significance of this study is to 1) highlight previous studies and their findings on softball body composition changes across multiple seasons; 2) understand softball injuries and trends; 3) find potential indications of injury risk from compositional changes across seasons; 4) contribute to limited research on multi-seasonal softball. Methods: Three forms were completed by participants. Participants filled out an informed consent form, a questionnaire on sleeping habits and experiences, and a final questionnaire on training log, injury log, and menstrual history, and contraceptive use. After completing the forms, participants were scanned for anthropometric measurements using a dual-energy x-ray absorptiometry. Results: With data collection still underway, our hypothesis is injury prone softball players are more likely to develop during the off-season, or pre-season based on anthropometric markers collected. Conclusion: We suspect lower lean-mass, higher fat-mass, lower bone mineral density, and overall; less/increasing conditioning contribute to higher injury risk. Future Directions: Further topics to explore include the menstrual cycle's effects on performance and sustained injuries across seasons.

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Human Services

Jackson County Hygiene Center – Eden Baucom, Sara LeVasseur, Derek Nelson, Stephanie Reyes

This presentation looks at the issues that arise for homeless individuals as a result of not having access to hygiene resources such as bathrooms, showers, washers, and dryers. This can lead to individuals not being able to care for their immediate and chronic health conditions and can result in multiple ER visits and negative long-term effects. There are programs out there that are providing these hygiene resources for their community in places like Portland and have been successful. Jackson County Hygiene Center is a proposed program that is a drop-in center in Jackson County, Oregon which would allow homeless individuals access to free public restrooms, showers, washers, and dryers. This program would hope to reduce the homeless individuals who lack access to hygiene resources in Jackson County, Oregon.

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*Baylor University, with North Carolina State University SROP Dr. Christie Almeyda-Becerra
Biology*

Production of sweetpotato clean stock using micropropagation and virus testing

The sweetpotato industry in the U.S. is growing and with that growth upkeep of clean stock is necessary. The North Carolina State University (NC State) Micropropagation and Repository Unit (MPRU) acts as a clean center for a variety of crops, one of them being sweetpotatoes. The MPRU consists of virus molecular diagnostics on sweetpotatoes, micropropagation, improving greenhouse conditions and field work on sweetpotatoes. Micropropagation will be used to produce virus-tested sweetpotatoes and these cuttings will be assessed. In addition to the previous methods, molecular diagnostics on sweetpotato plants will be executed to identify viruses on the plant over various seed generations. Over 30 viruses have been found to infect sweetpotatoes worldwide and 6 of them are of interest to the MPRU. There is a lack of clean planting material in the U.S. Therefore, improving techniques of sweetpotato cultivation by enhancing a clean seed program is vital to the sustainability of sweetpotato production in the U.S.

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*University of New Hampshire, Dr. April H. Bailey
Psychology*

Of Minds and Men: Androcentric Biases in Perceptions of Artificial Intelligence

Developers of artificial intelligence (AI) have found that anthropomorphizing AI assistants as women increase consumer trust. Utilizing feminine gender cues to increase interest in AI could have social consequences. As AI is becoming commonplace in the home, medical, workplace, and academic settings, social interactions with AI have the potential to shape perceptions of and interactions with real women. The proposed study will further investigate perceptions of gender, AI, and AI mindedness (mental, social, and emotional capabilities; Gray et al., 2007). As part of a larger examination of possible gender biases in the perceptions of the mindedness of different types of entities, this study will focus specifically on perceptions of AI. Based on our prior research, we first anticipate that AI will be perceived as male-gendered by default. We will also test whether male-gendered AI will be perceived as having greater mindedness capabilities compared to female-gendered AI. One possibility is that people will perceive AI as male-by-default but when specifically asked about female-gendered AI they will perceive female (vs. male) AI as more having more mental, social, and emotional capabilities. Special thanks to my mentor, Dr. April Bailey, Bailey Identity and Social Cognition (BIAS) Lab members, McNair Staff and Summer 2023 Scholars. This research Funded by the UNH McNair Scholar Program.

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Biomedical Sciences

Identification and Characterization of C-type Lectin Isolated from the Venom of *Crotalus Scutulatus Scutulatus* and Its Effects on Endothelial Permeability

Snake venoms are composed of an array of toxins that serve multiple functions to ultimately aid in prey capture and digestion. The venoms of North American vipers contain ubiquitous toxins that can cause rapid local effects (e.g., tissue death, excessive bleeding, and swelling) that graduate in severity over time. If treatment is not received promptly after envenomation occurs, this cascade of events can result in the surgical removal of damaged tissue, paralysis, amputation, or death. Limited research has been conducted on the acute endothelial dysfunction caused by non-enzymatic toxins in the venoms of North American snakes. Non-enzymatic C-type lectins (CTLs) have been found to activate the integrin receptors on endothelial cells, leading to the release of proinflammatory cytokines. This, in turn, can result in cytoskeletal remodeling and increased vascular permeability. The purpose of the present study is to identify and characterize the non-enzymatic components of *Crotalus scutulatus scutulatus* venoms, specifically CTL, that could majorly contribute to the acute local effects of viper venoms. We isolated CTL from the venom of *C. s. scutulatus* using immobilized D-galactose gel. The CTL will be identified using N-terminal sequencing, and its effect on endothelial permeability of human dermal blood endothelial cells (HDBEC) and human dermal lymphatic endothelial cells (HDLEC) will be further tested. Understanding the local pathophysiology of snakebites is integral to developing more efficient and effective mitigating treatments for the immediate effects of snake envenomation.

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Agricultural Science

The Use of Environmental DNA to Monitor the Presence of Feral Hog (*Sus Scrofa*) Populations Within Cattle

Feral swine populations pose a significant risk of damage to agricultural commodities each year. Among this damage is the potential for disease transmission within rangeland cattle communities. Monitoring and control methods are generally costly, time-demanding, and labor intensive. The use of environmental DNA (eDNA) to monitor species populations is gaining popularity due to its ease and quick results but lacks research within nonaquatic species and the interaction between other biotic factors such as the presence of another animal's DNA within the sample. This study will determine how the presence of cattle manure, or eDNA, will degrade samples testing for feral swine. In a lab setting, researchers mixed domestic hog and cattle manure at 5 different concentrations including positive and negative controls, and tested each at 0 hours and every 14 days for a 42-day period. Researchers utilized conventional polymerase chain reaction (cPCR) testing to provide positive or negative results for the detection of feral pig DNA. Samples will mimic what may be taken in natural bodies of water, therefore providing results regarding when samples should be taken for the best possibility of successful monitoring. The results of this experiment may be immediately applied to real-life scenarios and benefit the future of feral hog monitoring.

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Psychology

Workplace Attitude & Gratitude: How Inclusion in the Workplace Can Impact Organizational Citizenship Behaviors

In recent years there has been an emphasis on the importance of the values of organizations. Values of organizations have the possibility of impacting employees' lives. If employees are unhappy and feel undervalued they may not invest in their job further than what is explicitly stated in their job description. One way to make employees feel valued and cared for, is to develop inclusive environments. If the work setting has inclusive culture behaviors, the employees may change their mindset. For instance, employees may start to participate in organizational citizenship behaviors. In this proposed project we intend to explore the relationship between inclusive leadership, inclusive culture, and organizational citizenship behaviors. We expect to find that when there is more inclusion more employees engage in organizational citizenship behaviors. We also expect that the relationship may be strengthened by inclusive leadership in the organization. We plan on conducting this research using a non-experimental survey and using ANOVA and potentially mediation analysis to explore the results. This is valuable research because it has practical implications for leaders to improve the experience of the workforce and could benefit not only organizations but the employees within them.

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Educational Psychology

Sibling Implemented Mand-Training to Increase Mand Variability in Children with Autism

Children with autism spectrum disorders (ASD) may struggle with engaging in prosocial behavior that aligns with their typically developing peers due to difficulty in verbal and social skills. Children with ASD often receive behavioral interventions to promote acquisition of verbal behavior and social skills. Researchers and clinicians commonly implement these behavioral interventions. However, it is important to evaluate the extent to which family members can implement these interventions. The purpose of the current study was to evaluate a sibling-implemented intervention consisting of script training and a lag schedule of reinforcement to increase mand variability. Mand variability refers to requesting for items using different phrases such as “can I have”, “I want”, and “may I please have”. This research was completed under the mentorship of Dr. Jessica Akers, Assistant Professor of Baylor University's Educational Psychology Department and through Baylor University's McNair Scholars Program. We conducted the study in a clinical setting and used single-subject research design. We conducted 12 5-minute sessions using a reversal design, examining how sibling implementation of scripted mand training impacts the social skills and mand variability of the child with ASD. A secondary purpose of this study was to assess qualitative changes in the dynamic between the child with ASD and their typically developing sibling. We observed an increase in mand variability in our participant with ASD, indicating that the sibling-implemented intervention encourages both prosocial behaviors and verbal skill acquisition in children with ASD. Future research could examine the efficacy of script fading in sibling-implemented mand training.

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Education*

Highlighting Latine Family STEM Talk and Beliefs through Early Childhood STEM Learning Programs

STEM education systems can change to support the assets of Latine families and learning from families must be the starting point. Emerging studies suggest that experiences with STEM in early childhood provide a critical foundation for long-term STEM-related engagement and career pathways. At this early age, talking with family members about STEM topics has been shown to contribute to STEM identities and exploring different ways of engaging with STEM (Dou et al., 2019). However, more research is needed to understand the nature of this talk within families and how it supports aspirations within specific fields, especially for Latine families with young children. In this study, we examined the beliefs that Latine families had before and after participating in early childhood engineering programs with their children and how they may utilize STEM talk to raise awareness of and develop interest in various STEM fields. To further investigate this, we conducted in-depth semi-structured qualitative interviews with three Latine families that participated in early childhood engineering programs. We used a Community Cultural Wealth (Yosso, 2005) framework as a general approach for STEM talk. By the end, we hope to highlight the ways early childhood engineering programs can engage STEM talk within Latine families and their assets that support their children's STEM interests. This work will lead to new research on the significance of early childhood, family-based engineering programs and how STEM talk manifests among families. This research will increase awareness of asset-based approaches among researchers, educators, and practitioners when working with Latines.

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Health Science Studies*

A Comparative Study of Healthcare Systems in the United States, France, Spain, and Costa Rica

The field of medicine is consistently adapting to better improve the assistance that is provided to people in need, yet countries globally have developed diverse healthcare systems, some public and others privatized. This study explores and compares the healthcare systems of the United States, France, Spain, and Costa Rica, focusing on their patient-doctor relationships and medical practices. Through extensive background research encompassing demographic diversity, major health concerns, lifestyle, and cultural factors, the interactions between healthcare facilities, practitioners, and patients in each country were examined. Comprehensive insights were achieved from questionnaires and semi-structured interviews that were asked of both healthcare practitioners and patients residing in each nation to distinguish between the system's availability to the people, techniques and practices performed, availability of resources, and patient-doctor relationships. The initial findings suggest that while resources and medical practices were uniformly consistent in each nation, the countries that offered universal coverage of healthcare services, France, Spain, and Costa Rica, observed greater indications of trust in practitioners, leading to increased patient utilization of medical services; however, the United States exhibited a burden in their patient-doctor relationship from concerns over cost and coverage, causing skepticism towards healthcare professionals' capabilities. The study highlights the significance of cultural context and healthcare accessibility in shaping patient perceptions and experiences. As the medical community seeks to improve patient care and satisfaction, the insights from this study can serve as a valuable resource for policymakers and healthcare practitioners in enhancing healthcare systems worldwide.

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Music Education

Correlating Music Preference and Anxiety Levels in College Students

In a previous study done by Rentfrow & Gosling (2003), music preference and depression were linked, however, there are no prior studies that have correlated music preference to anxiety levels, especially in college students. Aside from the selected participant group being highly accessible to the researcher, college students may be the largest group of consumers that listen to new music genres. The purpose of this study is to find out if there is a correlation between music preference and anxiety levels in college students. Past studies are limited, outdated, and feature an experimental design versus my survey study design. Research with updated music genre availability may significantly contribute to the music education discipline. This quantitative study used two pre-established measures: The Short Test of Music Preference (STOMP) and The State-Trait Anxiety Inventory (STAI), and they took about 10 minutes to complete. Voluntary participants who showed up to the music lab and completed the surveys received refreshments. Data will be analyzed using Pearson-product-moment correlation procedure to examine the bi-variate relationship between music preference and anxiety level. Descriptive statistics and figures for all variables will be computed using Statistical Package for the Social Sciences (SPSS 2022). The researcher expects to see a correlation between participants' music preferences and their anxiety levels depending on the stimulating or relaxing nature of each preferred genre.

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Environmental Science

Degradation of Plastic Nurdles using Mechanical and Enzymatic Degradation

From our daily cups of coffee to cutlery and food packaging, plastics have become indispensable, especially in the food and drink industries. Many of our plastic products are formed from malleable plastic beads called nurdles. Nurdles are hard to keep packaged because of their small size. One major issue in plastic pollution is that the nurdles and the final plastic product do not degrade. This issue has encouraged researchers to research possible routes of degradation through physical, chemical, and biological mechanisms. Each process is different, but all methods ultimately break the bonds in the backbone of the plastic polymers into oligomers or minerals. For this study, mechanical grinding and enzymatic digestion were used separately and in combination to force plastic degradation. Materials were ground with a mechanical blender over varying times and temperatures. Further, the resultant degraded plastics were subjected to specific enzymes that bind to a specific plastic surface. Each plastic was analyzed for differences in surface features before, during, and after the degradation process using Fourier Transform Infrared spectroscopy and Scanning Electron Microscopy. Our preliminary results show that mechanical grinding increases the surface roughness of plastics and produces micronized flakes and particles that are easily removed from the larger plastic surface. In addition, the enzymatic degradation increases the oxidation of plastic surfaces which further helps to make the plastic brittle. These degradation processes have been shown to be effective in the literature, and this study will contribute to the knowledge of plastic degradation processes.

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Public Health

Suicidal Ideation, Unsafe School Environment, Technology Usage, and Depression in Relation to Substance Usage

Suicidal ideation, feeling unsafe at school, amount of technology usage, and depression are correlated to increase substance use among adolescents in Texas compared to the United States. Substance use is a major public health concern in the United States and understanding the factors associated with use in adolescents may help lower rates of alcoholism in adulthood. Furthermore, the impairments caused by substance use on the development of the brain is well documented in the literature. A comprehensive literature review was conducted prior to data analysis. Following the literature review, SAS 9.4 was used to analyze data from the Youth Risk Behavior Survey at the Texas state level and nationally. Results are still being assessed and future areas of research are still being hypothesized.

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Biochemistry

Fluorescence Anisotropy to Further Elucidate Rad4-TFIH Dynamics

The nucleotide excision repair (NER) pathway is triggered when the XPC–RAD23B–CETN2 trimeric complex initially identifies DNA lesions within the genomic DNA. Subsequently, this adept complex recruits the general transcription factor complex, TFIH, to facilitate the process of lesion verification. The precise structural mechanism underlying the recruitment of TFIH by Rad4/XPC and its role in initiating nucleotide excision repair (NER) remains elusive due to the inherent constraints imposed by the current structural resolution, in the range of 7.9–9.6 Å. Using reversible molecular photoswitches alongside fluorescence anisotropy we hope to aid in obtaining a higher resolution structure.

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English Literature

Distracting or Didactic: Understanding the Purpose of Dialect in Victorian Scottish Working-Class Poetry

For around 100 years, scholars have disregarded Scottish working-class poetry from the Victorian era due to its supposed irrelevance, leading to a gap of knowledge in the field. Many believed that the poetry's heavy use of dialect placed it in a category that did not need to be studied because it did not realistically represent the people of the Victorian era, but by avoiding the study of this body of literature, scholars have strayed away from understanding the class of individuals that it represents—the working class. This study aims to combat the stigma of irrelevant Victorian working-class poetry by researching a set of dialect poems published in and near Glasgow between 1866 and 1882 within the context of greater historical movements to understand their cultural relevance. It was discovered that these poems speak more truthfully to the people they represent than previously researched literature by working as a means to preserve, grow, and represent working-class values and traditions.

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Baylor University, with Dr. Emilie Cunningham

Maternal and Child Health

Enhancing Maternal Support and Infant Feeding: A Pilot Review of One FQHC Lactation Clinic

Although most women opt to feed human milk to their infants, a vast majority do not meet their breastfeeding goals. Facilitating forms of lactation support that extend the duration of breastfeeding may lead to significant physical and emotional benefits that are dose responsive. The purpose of this study is to measure the duration of breastfeeding among participants in the Waco Family Medicine lactation clinic compared to breastfeeding rates resulting from usual care at one Federally Qualified Health Center (FQHC). The research methods include comparing breastfeeding duration among clinic participants to standard rates at one FQHC. The study specifically targets low-income individuals, most of whom are enrolled in a Medicaid managed care organization. The results of this pilot may provide initial insights into the potential benefits of lactation support interventions in improving breastfeeding outcomes in underserved populations. Compared to usual standard care, patients that received lactation support through the Waco Family Medicine lactation clinic extended lactation duration by at least 32.2%. Results from this study may suggest early indications that primary care lactation support is related to breastfeeding duration. The findings may contribute to the implementation of analogous interventions in other underserved communities. Additionally, this pilot study may be used to inform future breastfeeding interventions aimed at extending breastfeeding duration and enhancing maternal and infant health outcomes among FQHC patient populations.

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Neuroscience

The Effect of Stress on Pavlovian Conditioning

The purpose of this study is to identify how a single stressful experience affects Pavlovian learning. Prior research demonstrates that a single exposure to stress produces a long-lasting increase in Pavlovian conditioned responding, and this increase involves the midbrain dopamine system. However, the stress-related signals mediating this increase remain unknown. Stress promotes the release of corticotropin-releasing factor (CRF) into the ventral tegmental area (VTA), a key dopamine-producing nucleus in the brain. Dopamine neurons in the ventral tegmental area (VTA) have been shown to mediate reward intake, memory, and learning. Additionally, it is unclear whether sex or the estrous cycle may influence Pavlovian conditioning, as sex- and estrous-differences have been identified in stress responses. I hypothesize that CRF receptors in the VTA are required for stress to enhance conditioned responding. To test this hypothesis, I will inject a CRF receptor antagonist (alpha-helical CRF) or a vehicle control into the VTA prior to stress in male and female rats. I will then determine how these intra-VTA injections prior to stress subsequently affects conditioned responding across Pavlovian training sessions.

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*New Mexico State University, with Dr. Jim Leebens-Mack & Dr. Donovan Bailey
Biology*

Using whole genome sequencing to generate phylogenetic data for Agave

Agave is a diverse and complex group within the family Asparagaceae and presents a challenge for phylogenetic studies due to the rapid diversification of species. To address this, we employed a targeted sequence capture approach using a series of suites of python scripts composed of hybpiper, MAFFT, IQ-TREE, and ASTRAL in order to yield robust phylogenetic data sets, revealing underlying evolutionary patterns. This method allowed us to investigate the evolutionary relationships within Agave and gain insights into its taxonomy and diversification. The significance of this research lies in the enhanced understanding of this enigmatic group's evolutionary history and taxonomical relationships. To test our hypothesis, we collected samples from diverse Agave species and used hybpiper to target specific genes of interest. The obtained sequence data were then aligned using MAFFT and subjected to IQ-TREE for phylogenetic inference. Finally, ASTRAL was employed to construct a species tree, effectively resolving the complex phylogenetic relationships within the group. The results of our study revealed a well-supported phylogeny for Agave, allowing us to observe distinct clades corresponding to major geographical regions, suggesting a potential biogeographic influence on the diversification of the group. Additionally, our analyses identified potential cryptic species within Agave, highlighting the importance of taxonomical revision and further exploration. Overall, this study sets the stage for future research on the evolutionary dynamics and diversification of this intriguing group.

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Psychology*

Caregiver Recommendations for Prize-Based Contingency Management in Juvenile Probation

There is growing interest in training juvenile probation officers (JPOs) to deliver incentive-based contingency management (CM). However, prior research has focused on training JPOs in CM programs that target adolescent behavior and use financial incentives. We developed a prize-based CM program for caregivers of youth on probation supervision to target engagement in their child's probation services and assessed the families' perception of the program. Results of this study have the potential to inform the design of CM programs in juvenile probation settings. Eighteen caregivers ($Mage = 42.72$, $SD = 8.09$) who participated in a 16-week prize-based CM program as part of an ongoing randomized control trial testing the use of CM to reinforce caregivers' engagement in their youth's probation services, completed an in-depth qualitative interview about their perception of the program. Three themes emerged in our initial coding of five transcripts: program endorsements ($\kappa = 0.90$), modifications to implement ($\kappa = 0.88$), and elements to eliminate ($\kappa = 0.88$). Most caregivers endorsed liking the chance to win prizes. Most caregivers also reported a preference for gift cards over goods, provided suggestions for specific goods, and believed any caregiver CM program should include incentives for the youth. Finally, caregivers believed slips with no monetary value should be removed from the prize program.

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Neuroscience

Exploring the relationship between mtDNA and fatigue in a LLC Murine Model

Cancer-related fatigue (CRF) is characterized by feelings of cognitive, physical, and emotional tiredness in response to cancer and/or cancer treatment. The prevalence of fatigue is high, with some patient populations reporting as high as 99% fatigue occurrence. Inflammation has often been associated with CRF, but recent research has pointed at metabolic dysfunction as a mediator between inflammation and CFR. We propose that changes in mtDNA-cn and cell-free mitochondrial DNA (ccf-mtDNA) due to cellular metabolic dysfunction may be a biomarker of CRF. We propose to test this using the murine LLC-tumor model and cisplatin chemotherapy. Mice with or without tumors were submitted to wheel running and received cisplatin or vehicle injections once weekly for 4 weeks. Tumor and cisplatin-bearing mice showed decreased nightly wheel running with Tumor-cisplatin mice showing the most severe fatigue-like behavior. mtDNA analyses are underway.

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Exercise Science

Influence of dietary nitrate supplementation on responses to a cold pressor test in young women

Hypertension is associated with cardiovascular disease and research specific to interventions that alter vascular function in young women is lacking. The purpose of this study was to investigate the influence of acute dietary nitrate, via beet root juice (BRJ) supplementation, on cardiovascular responses to a cold pressor test in young women. A total of 17 (aged 18-23) women completed this protocol. A repeated-measures, placebocontrolled, counter-balanced, crossover design investigated the impact of dietary nitrate on the cardiovascular system's response to a cold pressor test during a 4-min recovery window. All participants completed three laboratory visits (Visit 1 = familiarization, Visits 2 and 3 = experimental). The experimental visits differed in the BRJ formula; whereas the placebo had dietary nitrate removed by the manufacturer. A two-way, repeated measures ANOVA (Time x Treatment), revealed there was no interaction nor main effect of treatment on participants' heart rate and blood pressure immediately after or during a 4-min recovery period after a cold pressor test ($p > 0.05$). However, as expected, there was a main effect of time ($p < 0.001$); whereby minutes 0 and 1 were higher than minutes 2, 3, and 4 during the recovery window for heart rate and blood pressure ($p < 0.05$). BRJ in did not influence cardiovascular reactivity following a cold pressor test when compared to placebo. This research study will continue to recruit more participants, specifically minority women, to help further understand the acute impact of dietary nitrate supplementation.

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Psychology

Evaluating the Behavioral and Neuroinflammatory Effects of Chronic Mild Stress in Female Mice

Unpredictable chronic mild stress (UCMS) is associated with a variety of behavioral and neuroinflammatory effects. Our lab previously failed to detect behavioral and inflammatory effects of UCMS one week following the end of stress exposure in female mice. To determine if an effect would emerge at an earlier time point, we conducted a follow up experiment using a larger set of behavioral tests assessed immediately following stress exposure. We hypothesize that the additional depressive assessments may allow us to detect effects and that using a more acute time point would reveal neuroinflammatory changes. We will utilize a two group (+/- UCMS) design (n = 11 mice/group). We ran the UCMS protocol for approximately 3 weeks, conducting 0-2 stressors per day. We monitored activity via burrowing and sucrose water preference throughout. After 3 weeks of stressors, we evaluated depressive-like behavior. After completion of behavioral testing, the hippocampus was collected for analyses of brain inflammation.

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English, Psychology, and Library Science*

Increasing Social Emotional Awareness with the use of Bibliotherapy in a Storytime Setting

Bibliotherapy is the use of literature to help offer self-understanding, growth, and healing. Literature on this topic suggests that bibliotherapy is a beneficial tool, allowing children to relate to the character in the book being read and applying it to their own experiences. However, there is a lack of how this affects children who struggle with dealing with their emotions in a healthy way. This research will examine the impact of bibliotherapy in increasing the social-emotional awareness of preschool-aged children. Participants will be selected from local preschools using convenience sampling. Consisting of two groups, my participants in group 1 are in the 4.5-5 age range and a younger group of 3-4.5 year olds. To measure changes in emotional awareness and social-emotional development, a pre-test / post-test model will be used. Parents and preschool teachers will complete the Social-Emotional Assessment/Evaluation Measure (SEAM™) before and after the storytime interventions. Participating children will be assessed using categorization and labeling of emotional facial expressions flashcards. Between the pre-test and post-test, participating preschoolers will engage in storytimes focusing on central emotions. Research can benefit child psychologists, librarians, and teachers, as they can use it to help create reading lists or storytime themes to support the development of specific social-emotional skills in children. Preliminary results suggest that the children understand the basic categories of emotions like happiness, sadness, and anger. However, they struggle with the identification of more complex emotions such as excitement and love.

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*Wellesley College, with Dr. Eric Schelter
Chemistry*

Observing the CISS Effect through Magnetism of Chromium Clustered Shibasaki Framework

The Chiral-Induced Spin Selectivity (CISS) effect describes the selective transmission of electrons through a chiral system based on its spin orientation. With the CISS effect, researchers have studied helical chiral structures to understand the spin polarization phenomenon, and it was determined that one spin orientation of the electron moving through these enantiopure helical chiral structures is preferred over the other. The differing spin orientations exist due to magnetic interactions coming from the electrons, and it was initially presumed that the general energy difference between the spin states of the electrons is typically weak and negligible. But the reports on the CISS effect in chiral

biological complexes showed this energy difference between spin orientations is significant. Furthermore, the CISS effect emphasizes that the ability of MOFs to select their spin orientation should not be overlooked. In this project, the magnetic properties of synthesized enantiopure and racemic chromium cluster complexes will be analyzed to determine if there is a difference in spin selectivity within the enantiomers. Such studies on molecular compounds have yet to be explored in the literature. The CISS effect's studies on molecular platforms provide an attractive avenue to explore the interplay of efficient spin polarization and inherent chirality.

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St. Mary's University, with Dr. Shawn Parry-Giles
English Communication Arts

Last Words Unspoken: Discordant Military Discontent during the Vietnam War, Exploring Dennis Mora's Objection through Race and Class

During the Vietnam War, many individuals recruited in the military refrained from expressing opposition to the U.S. war efforts despite holding personal questions regarding its legality or logistics. This behavior can be attributed to the emergence of a propaganda machine within the U.S. during the Second Red Scare. Investigating the underlying reasons for silent military dissent becomes crucial as it highlights sentiments shared by many G.I.s during the Vietnam War, often stemming from their doubts about the legitimacy of a conflict seen as a "rich man's" war. The study uncovers the direct impact of race and class on deployment, as a disproportionate number of low or working-class minority G.I.s made up front-line casualties during the Vietnam War. The data and findings for this study were gathered through contacting various historical institutions, including the Wisconsin Historical Society, Library of Congress, National Lawyers Guild, Swarthmore College, and Memorial University. By cross-referencing the materials provided by these institutions, it was revealed that Dennis Mora, one of the founding members of the G.I. anti-war movement, underwent harsh treatment due to his minority status and conscientious objector stance. By examining the actions of Dennis Mora and his comrades, it was concluded that the U.S. government disapproved of conscientious objectors since they were perceived as disruptive to the war machine. As the study delves into historical infographic literature, it suggests the possibility of expanding the research to gather more evidence of the flawed nature of U.S. engagement in Vietnam.

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Psychology

The Role of Cultural Identities with Colorblind and Racist Attitudes

Understanding attitudes that perpetuate racism and racist systems is essential. In the modern-day context, racism is a denial of the prevalence of racism in our society and the daily struggles that people of color experience (Keum et al., 2018). Instead, the focus tends to blame disparities not in systems of inequity and oppression but on groups as a whole. In contrast, colorblindness is the belief that racism and racist ideology do not exist or matter (Keum et al., 2018). However, prior research has indicated that White racial identity attitudes are predictive of racism (Pope-Davis & Otttavi, 1994); prior research largely conceptualized White or ethnic/racial identity (ERI) as a unidimensional construct and not take into account national or U.S. identity (USI) as another critical domain of ones' broader cultural

identification (Meca et al., 2023). This study utilized a sample of 288 college students (74.9% female, $M_{age}=20.58$, $SD=2.37$) to explore the relationship between dimensions of ethnic/racial and U.S. identity and colorblindness and racist ideology among non-Hispanic White college students. A series of multiple regression indicated that positive correlation between U.S. affirmation of racism ($\beta=0.146$; $p<.011$) and color blindness attitudes ($\beta=0.188$; $p<.000$). Additionally, U.S. exploration was significantly positively associated with racism ($\beta=-0.145$; $p<.022$) and colorblindness attitudes ($\beta=-0.191$; $p<0.001$). The results can be used to assist in preventing the diffusion of colorblindness and racist ideologies among cultural identities.

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*Texas Woman's University, with Dr. Alannah Shelby Rivers
Psychology*

Fictional Book Genres and Trauma Healing

Creative bibliotherapy, the use of fictional media to help an individual improve psychological well being has been found useful in treating symptoms associated with different disorders such as anxiety disorder and trauma as well as aspects of emotional, cognitive, and social development more generally (De Vries et al, 2017; Sevinc, 2019). However, there is limited research on the role specific fictional genres play in trauma healing . It is especially limited in specific genres like mystery and thriller, romance, or fantasy which can feature characters experiencing traumatic experiences such as loss of a loved one, domestic violence or may not be as relatable to an individual. The data are being collected from individuals through an online survey. Individuals are readers of any genre, but were specifically recruited on romance focused book groups since it is a popular genre which also often contains trauma experiences or overlaps with other genres (e.g, fantasy) that contain these experiences. The hypothesis is that there will be differences in genres related to trauma healing, especially between romance being more beneficial in healing compared to mystery/thriller genres. Participants will report which genres they read most often, how much they read, self report trauma symptoms experienced in the past month and self report trauma healing in the past week. If results support the hypothesis, this will suggest directions for future research such as specifically focusing on benefits or harm for individual genres and trauma healing and if participating in therapy or in bibliotherapy plays a role.

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*Texas A&M University- Kingsville, with Dr. Maura Krestar
Communication Sciences and Disorders*

A Preliminary Investigation of Social Justice Perceptions Among Communication Sciences and Disorders Students

The purpose of this survey research is to provide preliminary data regarding social justice perceptions among Communication Sciences and Disorders students. Recent efforts include identifying how professions develop and implement equitable practices, as indicated by sustainable goals, human rights, and social inclusion tactics in terms of race, gender, class, disability, geography, sexuality, and language. Although these efforts take root in the professional realm, such issues should be introduced earlier. Current research does not adequately address current students' understanding of social justice in the health professions. For that reason, the current study will culminate with a

proposal for a study to collect qualitative data that reflects knowledge and opinions related to social justice in Texas A&M University-Kingsville (TAMUK) students majoring in Communication Sciences and Disorders (CSDO), a major that leads to employment as a speech-language pathology assistant or, with graduate work, a speech-language pathologist. The results of this study will benefit the decision-making of whether social justice should be introduced to students before heading into the professional realm. By participating in this study, participants will gain a better understanding of their self-social justice perceptions. The data collected from this study will help higher education administrators understand where Communication Sciences and Disorders students stand on social justice and whether it should be implemented earlier in their academic studies.

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Political Science*

The New Buffalo: The Benefits and Harms of Indian Gaming

Native American tribes once found self-sufficiency by living off the land and killing buffalo. As time progressed, the tribes' capability to gain self-sufficiency has changed to where most tribes now promote their economic development, sovereignty, and strong tribal governments through tribal gaming. Thus, tribes have cultivated their "new buffalo" through the provision from the Indian Gaming Association. While tribal gaming brings advantages such as increased job opportunities and revenue; it also brings disadvantages such as problem gambling and increased criminal activity. This research uses an economic and political focus on these topics, asking what the benefits and harms are to Native Americans from tribal gaming. The first step in approaching these questions is to understand the development of the Indian Gaming Association since the passing of the Indian Gaming Regulatory Act. Next, scholarly written sources, legal documents, and interviews with contemporary figures fill out a portrait of the current situation. This research's purpose is to evaluate how tribal sovereignty and Native Americans are affected by the presence of the Indian Gaming Association in an economic and political sense. Although the results are not finalized, this research's theory is that tribal governments gain slight tribal sovereignty from tribal gaming; however, the U.S. government gains the most benefits from tribal gaming. This research suggests the need for the U.S. Government to preserve and protect the tribal sovereignty of Native Americans through tribal gaming instead of using them as pawns in the economic and political process.

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Microbiology*

Cloning and Production of Guided Antimicrobial Peptide Detoxin-TK

The extensive use of antibiotics has led to the development of genetic resistance in bacterial pathogens. Engineered antimicrobial peptides (AMPs) have the capability to replace antibiotics, especially for gastrointestinal infections. To produce a protein commercially *E. coli* is the most common production tool, unfortunately, the AMPs kill *E. coli*. We used a SUMO carrier protein to detoxify AMPs and produce them in *E. coli*. AMP genes and primers were synthesized using an outsourced company. Primers were used to add ligation independent staggered ends to AMP genes through PCR. Ligation independent cloning into a SUMO vector was performed generating staggered ends which allowed

annealing of the vector in the AMP insert. We then transferred the SUMO vector/AMP to BL21 Escherichia coli high expression cells, followed by induction of expression, cell lysis and isolation of supernatant. We also performed Fast Protein Liquid Chromatography (FPLC) by using a nickel affinity column to bind 6his- tagged SUMO/AMP fusion protein. The product was then analyzed on SDS-PAGE gel, and yield and purity were calculated. Our experiment will allow us to progress by testing toxicity against a panel of bacteria in the future. The ultimate goal is to express AMP genes into Lactococcus lactic probiotic bacterium to permit testing in a mouse model, which will hopefully allow for the mouse to have a healthier gut microbiome after gastrointestinal infection.

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Microbiology*

Repurposing of naturally-derived VK-13 antimicrobial peptide using SUMO cloning vector

Traditional antimicrobials have facilitated the development of drug-resistant bacteria, indicating a need for alternatives. Antimicrobial peptides were discovered in the 1990s and are a promising next step against super-bacteria. AMPs can inactivate pathogens by disrupting bacterial cell membranes as well as modulating immune responses. AMPs can be developed to minimize dysbiosis and harm done to the host microbiome, which is an important component of antimicrobial development. I hypothesize that the effectiveness of the AMP VK-13 can be improved by fusing it to a carrier protein, termed SUMO, which is able to detoxify and produce the AMP. AMP genes and primers were outsourced and used to create ligation-independent staggered ends via polymerase chain reactions. Annealing enabled the AMP to be inserted into a SUMO cloning vector. The engineered plasmid was then transformed into BL21 Escherichia coli high-expression cells. Cell lysis and the isolation of the supernatant will be performed in order to purify the protein using Fast Protein Liquid Chromatography and a nickel affinity column for the present 6his tag. SDS-PAGE gel will be performed in order to calculate the resulting yield and purity. Beyond these experimentations, I hope to test the peptide's toxicity towards a panel of bacteria including Escherichia coli, Pseudomonas aeruginosa, Acinetobacter baumannii, and Staphylococcus aureus. Ultimately, the result can lead to the transfer of the AMP to Lactococcus lactis bacterium to allow for testing in the mouse model.

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*Southeastern Oklahoma State University, with Dr. Amy Madewell
Psychology*

Connections Between Burnout and ADHD Symptomatology in College Students

Burnout is a condition characterized by exhaustion, pessimism, and lack of efficacy. It can be detrimental to a student's academic performance and may also negatively affect their personal and social well-being. Additionally, attention-deficit/hyperactivity disorder (ADHD) is a neurocognitive disorder that affects impulsivity and attention. Despite an increase in ADHD research, there is a dearth of information related to ADHD in adulthood. The symptoms associated with adult ADHD have also been found to negatively affect college students' performance. We hypothesized that classroom burnout will be highly correlated with other types of burnout among students who met the criteria for ADHD symptomatology. Ninety-four students from a southwestern, rurally located university participated in this online research study. Upon completion of informed consent, each participant completed the Adult ADHD Self-Report Scale, an adapted version of the Copenhagen Burnout Inventory, and demographic questions. Of the total sample,

fifty-one students (54.3%) met the criteria for ADHD symptomatology and forty-three (45.7%) did not. Among the ADHD symptomatology group, we found a positive correlation between classroom and personal burnout, $r(51) = .73$, $p < .001$, accounting for approximately 53% of shared variance. Furthermore, we found a positive correlation between classroom and social burnout, $r(51) = .44$, $p = .001$, accounting for approximately 19% of shared variance. This research highlights how important classroom burnout is among students with ADHD symptomatology. However, future research is needed to identify the role ADHD symptomatology plays in personal, social, and classroom burnout.

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History*

Mexican Women in Atascosa County during the U.S.-Mexican War

My research is on the U.S.-Mexican War and women's experiences in South Texas, specifically Atascosa County. The topic of Mexican women in rural areas can be difficult to find information on due to the absence of primary resources. As someone studying the U.S.-Mexican War and women's experiences in South Texas, specifically Atascosa County, there are few works published on women's experiences around the future area of Atascosa County (1856). To understand the perspective and hardship women faced during the U.S.-Mexican War, I will use primary documents such as topography, ballads, memoirs, news articles, and other archival material. My research shows women's experience in rural South Texas during a war that is most often overlooked. The history of the small county is abundant but similar to the study of the U.S.-Mexican War, there needs to be more regarding women in scholarly work.

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Neuroscience*

Behavioral Effects of Oxycodone and Naloxone: An Experimental Study Measuring Precipitated Withdrawal

Following the COVID-19 pandemic, prescription opioid use and misuse has contributed to the ongoing opioid epidemic in the United States, and the negative consequences of opioid addiction on public health has been exacerbated. One particular concern is the impact of opioid addiction treatment and its consequent behavioral and neurobiological outcomes. We hypothesized that male and female subjects exposed to acute oxycodone injections followed by a naloxone injection will exhibit withdrawal driven changes in anxiety-like behaviors and thermal pain sensitivity. To conduct the experiment, adult male and female Wistar rats were subjected to repeated (twice daily for 7 days) injections of saline (1 mg/kg, i.p.). Subjects were then randomly divided into three groups: High-Dose Naloxone (HDN), Low-Dose Naloxone (LDN) and a Saline Control Group (SC). Each group received a single dose of oxycodone followed by an injection of HDN, LDN or SC. An array of behavioral and biological paradigms were then used to examine consequences of repeated exposure and evaluate behavioral changes and intensity of precipitated withdrawal symptoms. The exams were divided into passive and pain-sensitive exams. Passive tests were used to evaluate anxiety-like behavior and biological changes through the use of: a marble burying test, a precipitated withdrawal scale, and total weight change. To measure tolerance, a thermal nociception test was used to validate repeated exposure to the experimental conditions. 24 hours after naloxone injection, novel subjects were placed on an elevated plus maze to further assess anxiety levels and observe locomotion.

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University of New Hampshire, with Dr. Robin Sheriff

Anthropology and Classics

First-generation College Students Management of Social Class Identities

In the United States, social class is comprised of economic, social, and cultural capital but is commonly known to be based on economic capital. Due to their financial disadvantage, first-generation college students are more aware of social class in higher education. For first-generation students, education is seen as a ladder to a higher social class. However, research shows that it's challenging for first-generation to achieve this in a dominant middle-class environment in college because of the shock of differences between themselves and their peers, resulting in feelings of not belonging. Scholarly research also illustrates that first-generation students are noted to describe difficulty in higher education due to racial and class-based stereotypes. These challenges brought on by social class differences sometimes result in the development of "hybrid identities." Based on qualitative data, this study will analyze how first-generation students experience and manage their social class identities. The study will conduct photovoice method and a series of qualitative interviews, using the snowballing technique, social media, and the TRIO Program to gain a large and diverse sample of participants at UNH. This study will look at all college levels of first-generation students (freshman, sophomore, etc.), focusing on how social class identities affect their academic life, providing insight for educators to understand how first-generation students' identities are affected in higher education in the United States, particularly in Northern New England. The study's data is still being collected thus no conclusions have been made. Thank you to UNH McNair Staff, Scholars, and Dr. Robin Sheriff.

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Texas A&M University – Kingsville, with Dr. Elizabeth Staiger

Animal Science

Exploring Genotypes of Black and Brown Spotting in Dorper Sheep

Dorper sheep are a hair-type breed adapted to the heat and have two color phenotypes: a white body with a black head or a white body with a white head. However, there is variation in the amount of black found in Dorper sheep coats, indicating breeders can make genetic selection decisions on hair color to meet market demand. The purpose of this study was to identify mutations associated with colored spotting in Dorper sheep at Texas A&M University – Kingsville. We sampled 60 Dorper Sheep (55 females and 5 males) by recording 360-degree view photos of the sheep's body to quantify the amount of black and brown spots. DNA was extracted from blood to be used in a candidate gene study. The candidate genes targeted included melanocortin one receptor (MC1R) and tyrosinase – related protein 1 signaling protein (TYRP1) using polymerase chain reaction (PCR) and restriction fragment length polymorphism (RFLP) test. Gimp 2.0 software was used to quantify the amount of coat color. Out of the 60 sheep that were sampled, 22 have a full white coat, 17 have spots, 12 have specks, and 9 have brown spots. Genotyping analysis is currently underway.

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Wellesley College, with Dr. Yui Suzuki

Biological Sciences - Evolutionary Departmental Biology

The Hormonal Regulation of Temperature-Dependent Color Changes in Manduca Sexta Larvae

Genetic accommodation is an evolutionary process by which natural selection acts on developmental plasticity to generate novel phenotypes. In this study, we explored the molecular basis of genetic accommodation using two genetically accommodated strains of the tobacco hornworm, *Manduca sexta*, which change color to different degrees as a result of a change in temperature. RNA-seq on the brain/corpora allata complex revealed several changes in genes associated with juvenile hormone (JH) and ecdysteroid signaling. Our findings demonstrate that JH levels fluctuate in response to temperature, while the evolution of ecdysone levels underlie the process of genetic assimilation of the black larval coloration. Thus, changes in different hormones underlie distinct dimensions of genetic accommodation.

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Lamar University, with Dr. Raymond Doe

Psychology

The Monkey and Ladder Experiment: Does Conformity Stunt Critical Thinking?

This paper seeks to recreate the analogy of the “monkey and ladder experiment,” using human beings. This highlights the need to critically think in situations where conformity is present. This experiment forces people to start questioning social norms, traditions, and cultures that have descended over the years. This experiment will also answer the question on if conformity limits or stunts critical thinking. It requires 88 participants and 4 actors. To make the experiment better suited for human beings, the banana in this case would be chairs. Usually, the first instinct for people when they enter a room and see empty chairs is to take a seat. The deterrent or the water would be the use of confederates. This experiment would use deception to avoid the Hawthorne effect. To get better and authentic results it would be better to inform them that they are being involved in a different experiment. Hypothesis 1- The participants that walk into the room would conform by remaining standing. Hypothesis 2- all participants that walk into the room would choose to ignore the instructions given to them by the confederates and take a seat. Hypothesis 3- the participant would choose to leave the assigned room. This experiment encourages all people to be more aware of social and cultural norms that they follow and critically analyze the information.

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**On behalf of Baylor University
and the Baylor McNair Scholars
Program, we thank you for
attending the 2021 Virtual Baylor
McNair Research Conference!**



“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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