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2022 AGEP Student Success Conference
Student Oral & Poster Abstracts

The Graduate Hotel in East Lansing, Michigan
October 1, 2022

CrossTalks: 36 Student Oral Presentations
8:15 AM - 10:30AM
Kedzie Rooms A-C

Poster Session: 38 Student Poster Presentations
1:20PM - 2:30PM
Hopin Platform

MICHIGAN STATE UNIVERSITY

GRADUATE SCHOOL

Student Oral Presentation Abstracts
Kedzie Room A Facilitator: Dr. Fei Yan

Alexia Elizardo
Siena Heights University

Preservation of Sea Urchin Sperm by Refrigeration

Sea urchins have been used within high school and college laboratories because their gametes are exceptional for viewing cell and developmental processes. The viability of sea urchin gametes has been studied with two methods: cryopreservation and refrigeration. However, these methods of exploring viability have not received much attention in recent years. Conducting more research on these methods of gamete storage will enhance efforts to protect sea urchins and the ecosystems where they play an important role. This study is focused on determining how long the sperm of sea urchin species (*Lytechinus variegatus* and *Eucidaris tribuloides*) can be stored and to determine when the sperm stops being viable. The specific method for storage used in this study is refrigeration, because throughout the literature pertaining to storing sea urchin sperm by refrigeration there is no specific viability time noted, the time fluctuates between all articles. If a specific storage time can be found for the species used in this study, it would allow for researchers to duplicate the methods on other sea urchin species gametes.
Keywords: Sea urchins, gametes, storage, refrigeration
Social Impact: Environment

Faith Rue
Adrian College

Nerve Growth Effect on Regeneration of Planaria

Planarians have been studied for decades with research starting in the early nineteen hundreds. Their main focus with scientists is their regeneration growth as they are one of the few species able to fully regenerate after injury. The current study on Planarians is scarce, there is not much new research that has been published on Planaria, current research on nerve growth in Planaria has large gaps in the literature with little to no research done on the nerves themselves. This research project will look directly at their nerves during regeneration to see their growth patterns and look at directly how their nerves grow over the course of a few weeks; There will be several experimental groups so there is a timeline of their nerve growth during their entire regeneration process, we will be slicing planaria and letting the regeneration process happen for a certain amount of time, they will then be kept in formaldehyde after being euthanized and stained to be able to see the nerve growth. the data will then be collected and analyzed to see where their nerves traveled and connect at during that specific day of regenerating, there will be several Planaria in each group to look for similarities and differences in their nerve growth
Keywords: planaria, formaldehyde, regeneration
Social Impact: Environment

Shawna Oesterling
Adrian College

Assessing Fecal Contamination in the South Branch River Raisin Watershed

Escherichia coli (*E. coli*) is often used as an indicator of fecal contamination in fresh water. Elevated levels of *E. coli* show that fecal contamination has occurred which raises concerns for the safety of recreational waters due to the possible presence of microbial pathogens. In 2008, the South Branch River Raisin Watershed of Southeast Michigan received a Total Maximum Daily Load (TMDL) for *E. coli* concentrations exceeding Water Quality Standards set by the United States Environmental Protection Agency (EPA). Since then, there has been little published data based on regular microbial monitoring in this area. This study seeks to assess current *E. coli* concentrations in surface waters of the South Branch River Raisin using membrane filtration and selective and differential culture media. Samples will be taken from four locations in the City of Adrian every six days for approximately 42 days in September and October of 2022. A 30-day geometric mean will be used to compare *E. coli* concentrations during this period to EPA Water Quality Standards as well as to past studies. Data on current *E. coli* concentrations can be used to determine the safety of recreational waters as well as to document changes since 2008 TMDL.
Keywords: water monitoring, water pollution, *E. coli*, watersheds, tmdl
Social Impact: Environment

Alfredo Guzman
Roosevelt Univeristy

Synthesis of Antitubercular 2,6-dimethylimidazo[2,1-b] thiazole-5-carboxamide Derivatives

With more than 10 million new cases of active tuberculosis (TB) each year and an estimated one-fourth of the world's population carrying latent TB infection, TB, caused by the bacterium *Mycobacterium tuberculosis*, continues to be one of the top causes of death and morbidity globally. TB is an opportunistic infection (OI), as such, cases of the disease may be more frequent and or severe in patients with compromised immune systems such as HIV, diabetes, or some parasitic disease patients. The advent of extensively drug-resistant (XDR) and multidrug-resistant (MDR) TB has prompted researchers to look for novel and highly effective antitubercular drug candidates. As part of an extensive program into antitubercular compounds by our team, a library of 2,6-dimethylimidazo[2,1-b] thiazole-5-carboxamide analogues were synthesized to evaluate their antituberculosis activity and gain further insight into critical structure-activity relationships. In the process of synthesizing the ethyl 2,6-dimethylimidazo[2,1-b] thiazole-5-carboxylate, key observations were made that have the potential for a more effective preparation of the carboxylate scaffolding compared to previous reports.
Keywords: Tuberculosis, Imidazo[2,1-b]thiazole
Social Impact: Health Care

Diallo Patterson
Tuskegee University

Piloting a Novel Strategy to Assess Gluten Free Labeling

Gluten-free labeling provides consumers with a standardized label for managing their dietary needs, especially celiac disease, or any autoimmune reaction from eating gluten. Celiac disease affects around 3 million people in the United States. In August 2013, FDA issued final guidelines for gluten-free food labeling so consumers can be confident that products labeled "gluten-free" meet a defined standard for gluten content. Therefore, we are investigating the effects of label design variations on the usability of gluten warning labels. Specific design treatments include the presence or absence of a Front of Package Label, presence, or absence of a graphic icon with the warning, and whether the sign is framed positively ("gluten-free") versus negatively ("warning contains gluten"). The purpose of the study is twofold, first to pilot test a new methodology for studying food labels and investigate if there are differences between different styles of food labels and if a new method for collecting this type of data is feasible for future work. Participants were asked to

do an online experiment about gluten-free labels, during which they were shown a series of brands and asked if the product contains gluten. There are 30 trials total where participants (adults 18+) are shown one version of the label design at a time and asked, "Does this product contain Gluten?" The survey was available online for 3.5 hours, posted via social media, which recorded 138 total responses. Participants remotely complete an online survey via the Qualtrics platform, which recorded the responses and the time to respond, first click, last click, and page submission. In addition to the 30 trials, demographic questions about age, race & ethnicity, education level, and whether they eat a gluten-free diet will be included. We hypothesize that placement on the front of the package and the inclusion of an icon will increase accuracy.

Keywords: Celiac disease
Social Impact: Health Care

Javier Tobar
Michigan State University

PROSS Stability-Design Calculation to Stabilize the Structure of the NrfH for Better Expression Yield

Microorganisms compete with plants for the ammonium-based fertilizer applied to agricultural lands, and these microorganisms convert ammonium to nitrate which is not well retained in the soil and is easily leached into waterways. This phenomenon is detrimental to the marine ecosystem. Fortunately, a number of microorganisms convert nitrate back to ammonium via the dissimilatory nitrate reduction to ammonium (DNRA) pathway which involves two steps: reduction of nitrate to nitrite and then reduction of nitrite to ammonium. The second step of the DNRA pathway relies on the NrfHA complex where NrfA is the enzyme that catalyzes the reaction while NrfH serves as NrfA's redox partner, shuttling electrons to NrfA from the membrane quinol pool. While NrfA had been successfully overexpressed previously, NrfH is difficult to overexpress because NrfH is a membrane-associated protein. In previous studies, NrfH has been isolated via native expression which yielded low amounts of protein. The goal of this study is to redesign the amino acid sequence of NrfH to create a stable variant of NrfH that can be overexpressed. We did this in silico using Protein Repair One Stop Shop (PROSS), a software that predicts stabilizing amino acid substitutions that may stabilize NrfH. Then we will overexpress the most promising NrfH variant in Shewanella oneidensis. We hypothesize that the stabilized variant of NrfH will overexpress better than the wild-type protein. Our results will help us overexpress enough protein to characterize NrfH and its interactions with NrfA.

Keywords: energy storage device
Social Impact: Workforce Development

Emily Greeson
Michigan State University

Implementing a Quantitative Literacy Skills Inventory in a COVID-19 Era, Multidisciplinary Science Course

Multidisciplinary cooperation is central to the success of large-scale projects which require a wide range of expertise. Cooperative learning is a skill set that prepares learners to tackle interdisciplinary projects, and thus is an important component of undergraduate education. Here we conducted an intervention incorporating structural communication into a science course designed around cooperative learning. The aim of the intervention was to improve group cohesion and performance throughout the semester. The intervention was a student self-inventory of skills and a team-agreed compact that focused on communication surrounding quantitative literacy. Our study survey instrument aimed to examine the extent that the students found these interventions helpful and to identify what aspects of the interventions were most effective. Likert questions show most of the surveyed students reported finding it neither helpful nor unhelpful (40.6%) and 87.5% of students responded that they did not use the intervention again after completion. Written responses were open-coded and sorted into themes, and the results showed that students found the quantitative literacy intervention helpful for assessment of skill level (11 occurrences from 32 responses). One important finding was the connection between the tumultuous nature of the semester stemming from the COVID-19 pandemic

and the added strain to group dynamics, as indicated in peer evaluations. This stressor will be examined in more detail through excerpts from student quotations. The main implication from the assessment is the need for reminders throughout the semester to keep students referring to and engaging with the interventions. Additionally, the resilience of the class despite a dynamic semester is a positive indicator for future implementation..
Keywords: COVID-19, cooperative learning, quantitative literacy, higher education
Social Impact: Higher Education

Rashmi Jena
Michigan State University

Synthesis, Structure, and Properties of Mononuclear Y(II) and Dy(II) Complexes

There is an ever-increasing desire for smaller and smaller components for computers; as a result, the Single Molecule Magnets are of great interest for use in ultra-high density storage devices. Some of the most promising candidates in the field use lanthanides as the magnetic center, but the chemical environment greatly determines the effectiveness as an SMM. Dysprosium is of particular interest due to its strong spin-orbit coupling and large magnetic anisotropy, which can lead to observable magnetic hysteresis. We used Yttrium to establish synthetic protocols for dysprosium complexes of interest as SMMs. The complexes Y(NHAr)2Cl (1) and Dy(NHAr)2Cl (2), where Ar = a substituted 2,6-triaryl, were synthesized by salt metathesis and showed eta 6-arene 3-legged piano-stool geometries. Upon reduction, complexes 1 and 2 gave room-temperature stable arene sandwich complexes Y(NHAr)2 (3) and Dy(NHAr)2 (4). Interestingly, EPR spectroscopy on complex 3 indicates that the unpaired electron is delocalized over the ligand that interacts with the metal center. Reaction of 4 with [FeCp2][BArF24] gave dysprosium(III) [Dy(NH2Ar)2][BArF24](5). In this talk, the synthesis, structure, spectroscopy, and reactivity of the complexes will be discussed.
Keywords: single molecule magnets, data storage devices, metal-ligand interactions
Social Impact: Workforce Development

Seokjoo Lee
Michigan State University and Los Alamos National Laboratory

Exploring Structural Effects in a New Class of NRF2 Inhibitors

NFE2-related factor 2 (NRF2) is a transcription factor that is activated in the event of cellular stress to direct many different responses to restore homeostasis. Therefore, it plays a key role in the suppression of carcinogenesis, but constitutive NRF2 expression in cancer cells leads to resistance to chemotherapeutics and radiation therapy. As a result, inhibition of the NRF2 pathway is a target for new drugs, especially for use in conjunction with established chemotherapeutic agents like carboplatin and 5-fluorouracil. The first drug-like class of NRF2 inhibitors has been discovered with substituted nicotinonitriles, such as MSU38225. Even though our initial hit, MSU38225, has good activity, it has a relatively poor solubility as a major drawback. The effects of structural changes on NRF2 inhibition needs to be more explored to seek a more soluble derivative of MSU38225 with as good or better activity. For this, we are developing new methodologies for the synthesis of these compounds, along with employing a variety of standard methods to make new compounds. Recently, the Odom group has developed a synthetic method to produce substituted pyridines from isoxazole and enamine. In this project, we will explore structure changes on a key aromatic group with this synthetic method to produce cyclized derivatives in a few efficient steps.
Keywords: cancer, drug discovery, synthetic methodologies, structure-activity relationship
Social Impact: Health Care

Student Oral Presentation Abstracts
Kedzie Room B Facilitator: Dr. Terah Chambers

Daniela Rodriguez-Chavez
Cornell University

Exploring the Effects of Personal Impact Communicated Through Eco-Feedback Technology for Reducing Food Waste

We are surrounded by self-tracking technologies that provide us with vast amounts of personal data. However, having an abundance of information does not always lead to actionable change. The lack of personal impact and poor design often leads to ineffective eco-feedback technology. We explore how the communication of personal impact and different levels of specificity in information presentation can influence pro-environmental behavioral change. For one week, seven participants inputted self-measured food waste data into a website that showed four data visualizations with different levels of specificity and motivation. We found that communicating food waste data in terms of personal impact (i.e. money spent and daily progress) better motivated participants as opposed to visualizations emphasizing altruistic values. We found that each data visualization played a different role in helping participants analyze their food waste habits. The reported findings provide insight into elements to consider when designing eco-feedback technology.
Keywords: food waste, sustainability, self-tracking technology
Social Impact: Environment

Kaylee Cochell
Siena Heights University

Community Perception on Rehabilitation Efficacy in Drug Abuse Offenders

Drug addiction has seen a huge increase within the United States over the past few decades. Many who struggle with addiction have gone through rehabilitation programs with hopes of turning their life around. Rehabilitation is described as programing that serves to restore ones physical or mental abilities by training. Studies of rehabilitation focus on the availability and limitations that facilities experience when providing services. This study is designed to examine rehabilitation efficacy, especially for those with substance abuse charges. Different populations, including individuals who have gone through rehabilitation and those who indirectly experienced the programs, will be surveyed about their impression of the program. The survey will use a convenience sample and be posted on social media platforms where individuals over the age of 18 can participate and share their feelings about the effectiveness of drug rehabilitation programs. The survey will include questions about factors that could change the success rate of the program, such as family bonds, and their outside environment. The quantitative data will be collected and analyzed for an overall community perception of those impacted by rehabilitation.
Keywords: Rehabilitation efficacy, drug use, treatment, community perception
Social Impact: Criminal Justice Reform

Jessica Valdez
University of Colorado Denver

Investigating How Hate Crimes Against the AAPI Community Have Affected Perceptions of the Police

Over the last decade, police-community relations have been strained due to perceptions that law enforcement are racist and use lethal force excessively. To rebuild those relations, it is necessary to understand how citizens perceive the police, the causes of these perceptions, if these views are based on accurate data, and how we can change these perceptions. A review of multiple studies regarding these topics indicates that perception of effectiveness of the police, as well as perceptions about crime and safety were strong predictors of how satisfied citizens were with the police, and how common they thought misconduct is. However, many studies of police perceptions were done before the year 2020 and primarily address Black, White, and Hispanic/Latino populations, failing to include Asian-American/Pacific Islander views. This is relevant to study considering how the increase in hate crimes towards the Asian-American/Pacific Islander community because of COVID-19 may have affected police perceptions. Moreover, the concept of prosecuting a hate crime is also something relatively new to the criminal justice system. Through surveys and interviews, this project aims to understand the current views the Asian-American/Pacific Islander community has regarding law enforcement. The influence of race, immigration, pre-Covid experiences with the police, feelings of safety, and experiences with the police when reporting a hate crime will be examined. This presentation will examine results from a literature review of past surveys of Asian-American/Pacific Islander perceptions of the police, the design of the current survey, the distribution process of the survey, and next steps for the project.
Keywords: Hate crimes, Asian-American, Police, COVID-19
Social Impact: Criminal Justice Reform

Angelina Benli
John Jay College of Criminal Justice

One Man, No Vote: The Legacy of Felon Disenfranchisement

Over the past half century the population of those incarcerated in the United States has increased to 2.2 million. The state laws that govern whether felons can vote are not uniform, which leads to an unequal participation and unfair disparity in elections based on where an individual resides. Due to variant felon disenfranchising policies across the country, an estimated 6.1 million Americans are unable to cast ballots, which is 3% of the voting population. Past research shows that the formerly incarcerated have very low voter turnout. Executive Order 181 and subsequent Senate bill SB830 in New York State "auto-mat-ic-ally restored voting rights to people on parole, as well as provide notice to indi-vidu-als of their voting rights and a process for voter regis-tra-tion upon their release from prison," (Brennan Center for Justice, 2019). This project seeks to look at the involvement of community organizations in regards to the passing of re-enfranchisement legislation in New York State. By tracking the legislative history of re-enfranchisement bills in New York State, along with community organization involvement, and preliminary voter turnout data following Executive Order 181, this study can provide a greater understanding of how the political participation of ex-felons, or lack thereof, along with community organizations can inform future election and voter policy at the county, state, and federal levels.
Keywords: felon disenfranchisement, voting, political participation
Social Impact: Criminal Justice Reform

Jasmine Gillis
Roosevelt University

What Makes A Good Mathematical Proof

The purpose of the research was to create a method of categorizing mathematical proofs; specifically, what makes a proof that is good in an educational context and what makes a proof good in an applied or theoretical context. During the project 5 proofs of the irrationality of the square root of two and two proofs of the transcendental nature of e were examined using a checklist that highlighted which kind of proof was used (contradiction, construction, induction etc.) what justifications are given, what prior knowledge is needed, complexity level, where the proof is available, and how accessible the language among other observations. It was confirmed that mathematical proofs are heavily impacted by the intended audience and author's background specialty. It follows that reasoning and justifications used within mathematical proofs are similar within educational contexts and professional contexts.
Keywords: Mathematical Proofs Irrationalility
Social Impact: K-12 Education

Keenan Perkins
Florida A&M University

A Potential site for Islet Organoids Transplantations : Brown Adipose Tissue

Diabetes is a complex disease that affects more than 400 million people worldwide. The lifelong insulin injections and continuous glycemic monitoring required for type 1 diabetes (T1D) pose a huge clinical and financial burden driving the need for medical solutions. Islet transplantation is promising for the treatment of Type one Diabetes (T1D). However, the difficulty of regulating the post-transplant immune response to avoid rejection of both allogeneic and autoimmune transplants represents a bottleneck in the field of islet transplantation. Not only for animal models, but also for human patients. However, successful conversion of these studies into clinically appropriate therapies requires more optimal transplant sites and methods to improve the survival of islet transplants.
Keywords: Type 1 Diabetes
Social Impact: Health Care

Gerard Owens-Fryar
Michigan State University & Facility for Rare Isotope Beams

Uncovering the Origin of the Elements

Nuclear Astrophysics aims to explain the origin of the elements in the cosmos and Solar system. One location of heavy element production is the surface of neutron stars. Hydrogen and helium build up on the surface, until a rapid chain of nuclear reactions occurs; which can result in an explosion on the surface of the star. This chain is known as the rp-process or rapid proton capture process. Results from astrophysical models of the explosion depend strongly on a number of nuclear reaction rates, occurring both on the surface and inside the crust of the neutron star. The rate of nuclear reactions have a strong effect on models; therefore, they needs to be constrained to improve comparisons between model and observation. Since these reaction rates cannot be measured directly, they are determined using theoretical calculations, which require properties of the reacting nuclei as inputs. To find these inputs, total absorption spectroscopy (TAS) was used to study the decay of 51Fe and 60 Ga. This experiment was performed at the National Superconducting Cyclotron Laboratory (NSCL) in 2019.
Keywords: origin of elements, undergraduate mentoring
Social Impact: Workforce Development

Jamell Dacon
Michigan State University

Evaluating and Mitigating Inherent Linguistic Bias of African American English through Inference

Recent studies show that NLP models trained on standard English texts tend to produce biased outcomes against underrepresented English varieties. In this work, we conduct a pioneering study of the English variety use of African American English (AAE) in NLI task. First, we propose CODESWITCH, a greedy unidirectional morphosyntactically-informed rule-based translation method for data augmentation. Next, we use CODESWITCH to present a preliminary study to determine if demographic language features do in fact influence models to produce false predictions. Then, we conduct experiments on two popular datasets and propose two simple, yet effective and generalizable debiasing methods. Our findings show that NLI models (e.g. BERT) trained under our proposed frameworks outperform traditional large language models while maintaining or even improving the prediction performance. In addition, we intend to release CODESWITCH, in hopes of promoting dialectal language diversity in training data to both reduce the discriminatory societal impacts and improve model robustness of downstream NLP tasks.
Keywords: bias, fairness, inclusivity
Social Impact: Workforce Development

Vikash Kumar
Michigan State University

Efficient Depolymerization of Polystyrene with Table Salt and Oxidized Copper

The global production of polystyrene (PS) has exceeded 15 million metric tons in 2019 because of its widespread use in packaging and non-packaging sectors. Therefore, the development of efficient and low-cost recycling strategies for PS are highly desirable. Herein, we present a PS depolymerization approach that can be performed in the presence of table salt and oxidized copper scrubber. The obtained liquid portion has styrene content >83%. For the control sample (without NaCl or metal oxides), the styrene content was 66%. In addition, PS depolymerization in the presence of oxidized copper produced the styrene monomer in an 84% yield. The recovered styrene monomer was re-polymerized without further purification, and the thermal properties of the obtained PS were evaluated. This work has the potential to facilitate the chemical recycling of waste PS that is produced at a scale of 15 million tons/year using environmentally friendly catalysts and energy-efficient process; therefore, this study enables multiple green chemistry principles such as waste prevention, energy-efficient processes, and environmentally friendly catalysts.
Keywords: chemical recycling, depolymerization, circular economy, polystyrene, repolymerization.
Social Impact: Environment

Student Oral Presentation Abstracts
Kedzie Room C Facilitator: Dr. Jonathan Livingston

Jessica Allen
University of California, Berkeley

The Hidden Inheritance of Black Genealogies:
Exploring the Family-Building Crises and the Effects of Intergenerational Trauma, Hospital Culture, and the Science of Epigenetics

This research is grounded in the questioning of how embodied trauma from American chattel slavery impacts and passes down to Black pregnant people in child-birthing and child-rearing today. My interdisciplinary methodological approach combines autoethnography, archival analysis, oral histories, and other current research. It highlights the importance of utilizing intersectional approaches to represent all Black identities that are pregnant and parenting with inclusive language. I connect epigenetic sciences with discourses of intergenerational trauma to explore how the ongoing acts of violence of American chattel slavery, white spaces, structural racism, and biased healthcare culture impact pregnancy health throughout the generational of Black pregnant people in America. These occurrences and phenomena profoundly affect the totality of health and wellness for Black bodies. Still, additionally, these occurrences are the reason why birth outcomes for Black pregnant people and their families are at risk for adverse birth outcomes. Merging frameworks with the compelling research on the science of epigenetics by Dr. Amani Allen and Dr. Joy Degruy can reveal the implications of body memory and understand the pathways of generational trauma imprint.
Keywords: Black birthing outcomes and historical connections with slavery
Social Impact: Family Relations

Luke Boyce
University of North Texas

Longitudinal Effects of Hericium Erinaceus (Lion's Mane) Mushroom Supplements on Cognition, Mood, and Quality of Life

There has been abundant discourse surrounding the medicinal properties of various mushrooms and their fungal parts. The increasing popularity of supplementation and other wellness practices have given rise to a growing market of substances purported to enhance cognitive functioning, commonly known as "nootropics." Lion's mane (*Hericium Erinaceus*), a traditional Chinese medicinal mushroom, has shown promise in acting as a protective factor against the development of various neurodegenerative diseases. Although some existing studies have investigated the biochemical and medicinal efficacy of Lion's Mane, there is a notable lack of peer-reviewed behavioral research to support its specific effects on cognition (e.g., executive function, attention, mood), behavior, and quality of life. In the present study, we aim to carefully investigate the effects of Lion's Mane supplements on multiple objective domains of cognitive performance and subjective quality of life measures. To do so, we will recruit approximately fifty participants from a large public university in order to collect pre-treatment and post-treatment behavioral data through a combination of computerized cognitive tasks and self-report measures. Using a single-blind, placebo-controlled research design, we will first assign participants to their respective experimental and control groups, and they will complete baseline measures. Participants in the experimental group will then be carefully instructed to ingest dosage-controlled Lion's Mane mushroom supplements each day for six weeks. Following the completion of the study, we will conduct a follow-up assessment during week six to determine cognitive differences from baseline measures. Additionally, participants will be asked to return for further testing after four weeks following the cessation of treatment. Through this research, we hope to better understand which domains of cognitive processing are affected and to what extent they are influenced.

Providing evidence for cognitive enhancement in neurotypical individuals will support its use as a safe dietary supplement in the general population, and given the profile of purported benefits (pertaining mainly to executive functioning), Lion's Mane could serve a supplementary role in therapy for a variety of psychiatric disorders and conditions, ranging from ADHD to traumatic brain injuries.

Keywords: neurocognitive enhancement, anti-depressant, reward-seeking, therapeutic interventions,mental health
Social Impact: Health Care

Alyssa Sanborn
Siena Heights University

Effect of Family Income, School Budget, and Teacher Salaries on Student Performance

The factors that contribute to student success are debated by educators, legislators, parents, and many researchers. School funding in correlation to student success is examined in multiple studies and these studies conclude mixed results. There is an argument that family income has the most significant impact on student success. This research will be performed in Lenawee County, Michigan and will analyze topics of heated discussion in this area of research, family income and school budget. The research will also look at teachers, who have a direct impact on students in the school environment. Inside school budgets are teacher salaries that will also be compared to student success. A regression analysis will be used to examine the relationship between the independent variable, student success, and the three dependent variables, family income, school budget, and teacher salary. The study will use SAT scores to determine student success, as the SAT test is still playing a significant factor in college admissions. The research will analyze pre-covid years 2015-2019 so there are no inconsistencies related to the covid era of education. The purpose of this research is to evaluate the education in public schools of Lenawee County.

Keywords: SAT, student outcomes, family income, school budget, teacher salary, student success
Social Impact: K-12 Education

Angie Delgado
Roosevelt University

The Effects of Post Traumatic-Stress Disorder and Substance Abuse: Child and Adolescent Integration into Society

Traumatic events are not editable. No matter the age nor gender, trauma can occur at any given time. Unfortunately, "3 million children and adolescents experience some form of the traumatic event" (Schwarz, E. D., & Perry, B. D. (1994)). Children who suffer from trauma show deficits in learning and language development, which then leads to additional academic support. The problem I want to research is how traumatic events affect adolescents' integration into society. Specifically, how substance abuse and racial/ethnic differences contribute to trauma stressors from an ecological perspective. The methodology used to conduct this study is qualitative data from past research and peer-reviewed journals. The results demonstrated that having a strong relationship with friends and family, in-depth psychological interventions, exposure-based therapy, cognitive behavioral therapy, and TF-CBT [trauma-focused cognitive behavior therapy] have been effective treatments for children and adolescents who suffer from trauma and substance abuse.

Keywords: DSM-5, substance abuse, trauma, PTSD, abnormal cognitive development, childhood maltreatment
Social Impact: Mental Health

Chloe Bowers
Siena Heights University

The Effects of Context-Dependent Memory in the Classroom

Context-dependent memory is a form of learning that uses contextual cues, which are environmental stimuli that remain unchanged during the encoding and retrieval of specific information. The purpose of context-dependent memory is to improve the recollection of information while a particular contextual cue is being applied, for example, while memorizing information for a test. While there are other contextual cues that contribute to memorization, such as olfactory cues, which relate to our sense of smell, this study is primarily focused on visual contextual cues. This research project is intended to determine how context-dependent memory, in this case, the color of paper, impacts academic performance in the classroom. In addition, the study will address the effect that contextual cues have on students' ability to access material from their memory. Data collection will come from one main, quantitative source of data, with statistics generated from the study's test scores. The students will be randomly split into four different experimental groups and will have three minutes to study twenty words, on a green or white study guide. The students will then get three minutes to use memory recall on either the same or different color of paper and will write down as many words as they can remember. This study will analyze the differences in test scores based on the experimental group they were randomly assigned to. This project will contribute to the existing literature on context-dependent memory by focusing on the color of paper during encoding and retrieval in college students.
Keywords: context-dependent memory, contextual-cues
Social Impact: Mental Health

Isaiah Hawkins & Maria Onuoha
The University of Texas at San Antonio

How Self-Identification and View of Mental Health Affects Voting in the Post-Transatlantic African Diaspora

The Transatlantic slave trade took people from various regions in Africa and forcefully shipped them to The Americas. After hundreds of years of separation, the descendants of the people who were taken in the Transatlantic slave trade have developed different senses of identity and viewpoints. Isaiah Hawkins (MPA student at the University of Texas at San Antonio and Michigan State University SROP Alumni) and Maria Onuoha (Psychology major at the University of Texas at San Antonio) ask the question "How do the descendants of people taken in the Transatlantic Slave Trade self-identify ethnically, how do they view mental health and how does that impact the way that they vote?" We're interested in comparing how people from the Post-Transatlantic African Diaspora view themselves in relation to others in the Diaspora and how their views of mental health compare. In order to conduct this research, we have collected data from across the Diaspora and compared the data. We are documenting how much pan-Africanism exists in the minds of the people in the Post-Transatlantic African Diaspora, to what extent they acknowledge mental health and how much that affects their voting. We are using articles and surveys to collect this information. This information can be used to understand the evolution of ethnic-identity and thought by considering the regions' commonalities and unique characteristics. The results will help us see the differences in how people in the Post-Transatlantic African Diaspora perceive themselves, mental health and politics; and how each region's history might've influenced its citizens'/inhabitants' mindsets.
Keywords: ethnic identity, psychology, political science, African diaspora
Social Impact: Mental Health

Taylor Bradley
Roosevelt University

Problem-Solving Courts an Alternative to Incarceration

This paper examines problem-solving courts and how they began as an alternative to incarceration to lower the number of incarcerated individuals in the United States of America—the Incarceration Nation. This paper argues that every eligible individual that faces criminal incarceration for a crime that is regulated by a Problem-Solving Court be provided these individual and specialized treatment services to aid in healing their underlying issues that caused them to commit such a crime in the first place. In order to reduce recidivism rates, a therapeutic approach must be understood and interpreted when dealing with eligible participants. Our "one-size" fits all approach of incarceration is failing the citizens that make mistakes in our society. These courts not only give each participant an opportunity to reenter society, but they also give them a chance to succeed at it. These courts are not without criticisms, including issues involving coercion/due process concerns, eligibility requirements, and possible increased incarceration time/net-widening.
Keywords: problem-solving courts, alternative, incarceration, specialized treatment, therapeutic approach, recidivism,
Social Impact: Criminal Justice Reform

Jaleel King
John Jay College of Criminal Justice

The Role of Recent Illicit Drug Use and Life Satisfaction on Psychological Distress during COVID-19 Lockdown in Arab/MENA Adults

Psychological distress continues to affect adults globally, and the COVID-19 pandemic has exacerbated existing disparities in mental health outcomes. Although studies have examined the role of recent illicit drug use and subjective life satisfaction on psychological distress, few studies have examined this interplay in the COVID-19 context. Furthermore, no studies to date have investigated these mechanisms among Arab, Middle Eastern, and North African (MENA) adults, despite this population showing disparities that may differ substantially from their White-identified counterparts. To that end, this study investigates the impact of both recent illicit drug use and subjective life satisfaction in Arab/MENA adults during COVID-19 lockdown. Cisgender adults who self-identified as Arab/MENA (N = 267) completed a 20-minute online survey via Qualtrics that was translated and back-translated into Arabic. Measures included the General Anxiety Disorder 7 (GAD-7), the Patient Health Questionnaire (PHQ-9), and a one-item Likert-type measure on subjective life satisfaction. Covariates included age, gender (cisgender men, cisgender women), sexual orientation, education, and urbanicity. Multivariable linear regression and hierarchical regression models with robust standard errors were used to examine effects. Past 90-day drug use was associated with greater anxiety and depression, whereas opposite effects were found regarding subjective life satisfaction. The findings point to a need for psychosocial interventions that prioritize culturally responsive efforts to improve life satisfaction and reduce psychosocial distress among Arab/MENA adults.
Keywords: psychological distress, drug use, Arab, COVID-19, life satisfaction
Social Impact: Mental Health

Michelle Nelson
Lawrence Technological University

A Qualitative Investigation: Affirming Academic Belonging through Course-Based Research Experiences as a Student Success Framework for Students of Color

Around the world, social justice educators continue to rally, advocate and fight to dismantle systems of educational inequality and injustices that plague our education institutions as it impacts historically underprivileged students in academia especially among Black students, women and non-traditional students in STEM related courses and academic fields. Ensuring equity and inclusive academic practices for an increasingly diverse student population, course-based research experiences (CRE) rely on today's educators viewing student differences as assets and not deficits. Course-Based Research Practices serves as a direct response to deficit-based models to education of the past and a framework for student learning that is experiential and grounded in student centered instruction while developing sustaining practices for retention and student success. This session will report the findings of a recent study that highlight student experiences pertaining to their CRE experience, academic belonging and the reduction of academic stress and threats associated from traditional classroom experiences.
Keywords: course-based research, asset-based pedagogy, student success
Social Impact: Higher Education

Student Poster Presentation Abstracts
Virtual Location: Hopin
Engineering, Physics and Mathematics

Gregory Rodriguez
University of Illinois

NASA's Planetary Defense DART Mission With Target Reconnaissance

NASA's Planetary Defense Double Asteroid Redirection Test (DART) launched November 23, 2021, via a SpaceX Falcon 9 rocket from Vandenberg Space Force Base in California. On September 26, 2022, DART's autonomous spacecraft is scheduled to hit the moonlet orbiting a non-hazardous asteroid with a direct kinetic impact at 15,000 mph in order to change the moonlet's trajectory. With this test, NASA aims to be prepared to protect the planet in the unlikely event of a potentially hazardous asteroid by deflecting it. We map 28,651 near-Earth asteroids onto a 3 AU x 3 AU heliocentric grid. The resulting heat map shows a higher residence time of asteroids in a ring 0.50 AU to 1.50 AU from the Sun. Asteroid 2020 AP2 is of interest because it orbits the Sun passing through this ring. Its semimajor axis is 1.08 AU and its eccentricity is 0.0028, making its orbit nearly circular. We successfully model minimum-fuel locally optimal spacecraft trajectories to Asteroid 2020 AP2 useful for close photography, soft landings, and asteroid mining. In Case 1, a spacecraft using variable thrust is launched immediately and rendezvous with the asteroid in 410.5 days. In Case 2, a spacecraft using bang-bang control is launched in 6.6 years at a location 7° before the Earth and Asteroid 2020 AP2 are in conjunction and rendezvous with the asteroid 150 days later.
Keywords: planetary defense
Social Impact: Workforce Development

Jacquelin Chen
Stanford University

Assessing Nitrous Oxide Cycling in the Coastal Waters of the Eastern Tropical South Pacific Using Stable Isotopes

Nitrous oxide (N2O) is a climatically relevant greenhouse gas that can be produced in the ocean and emitted to the atmosphere, where it can later lead to ozone depletion. Previous studies show high accumulations of N2O above the oxygen minimum zone (OMZ) of the Eastern Tropical South Pacific (ETSP), but the relative roles of the microbial pathways that dictate N2O cycling vary regionally. The purpose of this study is to identify the primary pathways controlling N2O cycling in the coastal waters of the ETSP. In this study, N2O concentrations and its isotopes, as well as O2 concentrations and the isotopic compositions of nitrate and nitrite, were analyzed at three stations between the shallow coastal shelf and the shelf slope along the GEOTRACES GP16 Zonal Transect. Our results demonstrated a rapid decline in O2 concentrations coinciding with accumulation of N2O. This N2O accumulation is estimated to support significant fluxes of N2O to the atmosphere at our stations. N2O isotopocule results illustrate intense N2O cycling, driven by a combination of incomplete denitrification and hybrid N2O production in the oxycline. In the anoxic waters of the ODZ N2O isotopes indicate concurrent N2O production and consumption through changes in δ15Nα, δ18O, and δ15Nβ. Overall, N2O cycling in the coastal ETSP waters appears to be mainly driven by denitrification, with a smaller role from hybrid formation.
Keywords: vulnerability, equity, extreme events, health effects, food security, livelihood security, water security,
Social Impact: Environment

Jamell Dacon
Michigan State University

Examining Word Representations between #BlackLivesMatter Movement and its Counter Protests: 2013 to 2020

Since the fatal shooting of 17-year-old Black teenager Trayvon Martin in February 2012 by a White neighborhood watchman, George Zimmerman in Sanford, Florida, there has been a significant increase in digital activism addressing police-brutality related and racially motivated incidents in the United States. #BlackLivesMatter has become the most influential hashtag to date and is used as a “call to action” to protest police-brutality related and racially motivated related incidents and amplify social awareness surrounding Black lives [1]. In this work, we exploit social media as an authoritative tool to examine three mediums, namely the Black Lives Matter (BLM) movement and its counter protests All Lives Matter (ALM) and Blue Lives Matter (BlLM). Hence, we conduct a word-level text analysis on 36,984,559 tweets to investigate users' discourse to investigate word use to better understand the impact of digital activism within each social movement.
Keywords: BLM, ALM, social movement, social media, social discourse
Social Impact: Social Equity

Rahul Jain
Michigan State University & Facility for Rare Isotope Beams

Nuclear Reactors and Machine Learning

Nuclear energy is a crucial component to reduce carbon emissions and control climate change. However, it is not implemented at scale due to perceived fears about their safety and the problem of radioactive waste. The center of nuclear reactors harbor extreme conditions that can create a variety of exotic isotopes, most of whose properties are unknown to us. This ignorance compels us to resort to extra margins of safety leading to wasteful efficiency. We introduce a statistical model to theoretically predict the properties of these exotic isotopes by extrapolating known nuclear data. The predictions also carry quantified uncertainties thereby enabling newer, more efficient designs of nuclear reactors. Eventually, nuclear should be a prime tool in our arsenal for fighting climate change.
Keywords: nuclear energy, climate change
Social Impact: Environment

Saad Bezoui
CUNY Hunter College

Bayesian Analysis of Nuclear Saturation

We use Bayesian methods combined with recent uncertainty-quantified constraints from density functional theory (DFT) to learn systematic uncertainties from different DFT data sets and derive statistically robust constraints for empirical nuclear saturation point. At the 68% credibility level, we estimate n_0 \approx 0.155 \pm 0.014 \fmiq for the empirical saturation density and E(n_0)/A \approx -15.95 \pm 0.26 \MeV for the associated energy per particle. The inferred posterior overlaps significantly with a simple, box-like constraint commonly used in many-body theory to benchmark chiral nuclear interactions. However, our posterior tends to allow for somewhat lower saturation densities. Our framework can be readily extended to include future empirical constraints to rigorously benchmark saturation properties of ChEFT interactions in the FRIB and multi-messenger astronomy era.
Keywords: improved uncertainty qualification
Social Impact: Higher Education

Te'Ahrian Tyler
Virgina Union University

Deep Learning to Analyze Magnetic Particle Imaging (MPI) of Islet Transplantation

Current approaches to the quantification of magnetic particle imaging (MPI) for cell-based therapy are thwarted by the lack of reliable, standardized methods of segmenting the signal from background in images. This calls for the development of artificial intelligence (AI) systems for MPI analysis. We've already completed the first part of our journey to establish a standardized method of segmenting signal backgrounds in images. Now we want to make an algorithm that can analyze given data and result in an image without background noise. The goal of this research is to find a uniform way to analyze MPI's. The specific part of the algorithm I will be involved with is the detection array for our algorithm range. The "detection array" refers to the ideal range for detection of MPI cell-based therapy. This will be done until we can find the optimal range for the detection of iron oxide in the MPI's. (The iron oxide will be injected into the rats and used to track the cell-based therapy.) The remainder of the code will be written by another part of the research team. The algorithm will be added to an already built machine learning algorithm (K-means++). The already built algorithm is from a previous research paper by this team. The previous algorithm automated the segmentation of the region of interest that contained the nanoparticles. improves the resolution of MPI's and with the addition of our deep think algorithm we will be able to simply upload files to our new algorithm and it will give us a standard curve. (A standard curve is what tells the radiologist the severity of the cell-based therapy.) Our next steps in algorithm development will allow for the quantification of nanoparticles in the previously segmented regions of interest. This will help to automate and reduce bias in the image analysis process when it comes to radiology imaging. Resulting in more accurate and faster imaging analysis.

Keywords: Islet Transplant, magnetic particle imaging, deep learning, machine learning, algorithm
Social Impact: Workforce Development

Student Poster Presentation Abstracts
Virtual Location: Hopin
Life Science

Alexandra Bozan
Rutgers University

Developing Novel Antibacterials for M. tuberculosis Employing Computation, Chemistry and Biology

Tuberculosis (TB) is caused by the airborne bacteria *Mycobacterium tuberculosis*. It causes a chronic contagious infection that commonly affects the lungs. In 2020, TB was reported as the 13th leading cause of death and was the second leading infectious disease killer after SARS-CoV-2. Treatment of drug-sensitive TB consists of a cocktail of four drugs. A search for novel antitubercular drugs continues in the hopes of addressing drug resistance and shortening the duration of treatment from 6-9 months at minimum. Various machine learning (ML) techniques can be harnessed to discover new starting points for antitubercular agents. These methods employ modeling and analyses of large, publicly available data sets. The presented work will focus on recent efforts to construct, validate, and deploy innovative ML models of properties critical to the discovery of new small molecules with significant promise to seed antitubercular drug discovery efforts. Tuberculosis is a major threat to public health globally. The required drug regimen for those afflicted with the disease is lengthy, complex and costly. In addition, emergence of Multidrug Resistant TB is a cause for alarm to public healthcare.
Keywords: Tuberculosis, new drugs
Social Impact: Health Care

Ankita Bhattacharya
Michigan State University

PFAS Exposure from Home Produced and Local Foods in a Midwestern PFAS-Impacted Community

Introduction: Dietary exposure to poly- and perfluoroalkyl substances (PFASs) has been raised as a concern among communities with PFAS-impacted water. Elevated concentrations have been identified in livestock and wildlife as well as soils and produce from home gardens in impacted areas. While elevated PFASs in drinking water clearly contribute to elevated exposures, less is known about the contribution of home produced, locally bought and captured foods. Materials and Methods: We conducted a detailed exposure assessment for a Midwestern community with historic (2018) drinking water contamination. We enrolled 129 participants from 92 homes, administered detailed exposure questionnaires, and collected samples of produce and soil from home gardens, eggs from home raised chickens, venison from locally captured deer and other foods grown or raised near the community. Results: Samples were tested for 48 different PFASs including PFOA and PFOS, and non-targeted suspect screening was done on a subset of soil samples. Elevated concentrations of PFOS were found in eggs (3.5 ppb) and venison (14 ppb). PFOS was detected in all soil samples (maximum=1.8 ppb) but not produce. Produce contained low concentrations of other PFASs (<0.5 ppb) with the highest detection frequencies for PFHxS and 4:2 FTS (50%) followed by PFBS, PFOS, PFBA, and PFPeA (>30%). In addition to sharing details of these findings we will report exposure estimates for home produced and local foods using site-specific PFAS concentration and consumption frequency data. Conclusions: We expect that local and homegrown foods will be a predominant ongoing source of exposure that exceeds general population exposures but is significantly lower compared to historic exposure via drinking water in a Midwestern PFAS-Impacted Community.
Keywords: exposure science, food safety, PFAS contamination
Social Impact: Health Care

Ashley Challenger
The University of the Virgin Islands

Role of Resilient Coping and Family Functioning in Prescription Opioid Misuse during COVID-19 Lockdown

Opioid misuse continues to be a public health epidemic that has affected numerous countries, which was exacerbated by the COVID-19 pandemic. Although the literature suggests numerous health disparities worsened during the pandemic, few studies have examined disparities in prescription opioid misuse in an international context. Furthermore, even more limited research has identified potential mechanisms of reducing prescription opioid misuse during COVID-19 lockdown. As such, this study investigates the role of resilient coping and family functioning on the presence and severity of prescription opioid misuse during COVID-19 in an international sample. Cisgender adults from the United States, Italy, Spain, Saudi Arabia, and India (N = 2,482) completed an online survey via Qualtrics. Measures included the presence and severity of prescription opioid misuse (DAST; Skinner, 1982), Brief Family Functioning Scale (Mansfield et al., 2019), the Brief Resilient Coping Scale (Sinclair & Wallston, 2004), and sociodemographics such as country of residence, age, race/ethnicity, gender, sexual orientation, country of residence, educational attainment, employment status, and urbanicity. Data were analyzed using descriptive statistics, multivariable logistic regression modeling, and multivariable multinomial logistic regression modeling. The results shows an overwhelming majority of respondents identified as heterosexual, with more than 1 out of 4 individuals in the sample holding a master's degree or higher. Additionally, the majority of the participants were fully employed, with almost twenty percent reporting living in a rural area. The results on prevalence of prescription opioid misuse within a past 90-day span showed that having a high school education or less showed a medium effect as a protective factor against prescription opioid misuse. Respondents with lower educational attainment had significantly lesser odds of past 90-day misuse compared to those with a master's degree or higher. Furthermore, resilient coping and family functioning were associated with significantly lesser odds of past 90-day opioid misuse in the overall sample. Lastly, the results of the severity scale shows that compared to Americans, adults in the other 4 countries had a significantly lesser relative risk of being daily opioid misusers, and Bisexual and pansexual adults had a 1.83 times greater relative risk of misusing opioids at least once or twice during COVID lockdown compared to heterosexuals.
Keywords: COVID-19, sexuality, mental health, opiod use
Social Impact: Mental Health

Grace Igbinosun
University of Maryland and Medical University of South Carolina

Behavior of Cardiac Fibroblasts in the Presence of Hemodynamic Overload

Chronic pressure overload (PO) is a major problem that can result in heart failure. Hemodynamic overload leads to cardiac fibrosis, the development of extra collagen in the heart. Even if hemodynamic overload is reversed the fibrosis is still present and the fibroblast that produces this collagen remains in an activated state. This is reflected in the collagen volume fraction (CVF) which remains persistent. In addition to looking at collagen production, we look at matrix metalloproteinase (MMP) and tissue inhibitor of metalloproteinase (TIMP-1) production. MMP is an extracellular protease that is required to digest collagen fibers and reduce collagen content. We see less MMP in TAC/ UnTAC mice hence more collagen production. TIMP-1 is seen more in TAC/UnTAC mice hence why we see more collagen in these mice. Our aim is to test the hypothesis that an increase in the hemodynamic load of the heart results in activated cardiac fibroblasts that deposits more collagen leading to fibrosis and remains activated even when the hemodynamic load has been returned to a normal physiologic state. Our study uses a murine model which has gone through Transverse Aortic Constriction (TAC) then, had the constriction removed (UnTAC) and a wild type mouse who did not undergo the TAC procedure. The fibroblasts from these mice are harvested and placed on a 2 and 8 kPa culture plates. The 2 kPa plate used is soft on the surface. Reflecting a healthy heart. While the 8 kPa plate is stiff and reflects a heart experiencing

cardiac fibrosis. A normal fibroblast from a healthy heart will be activated on a stiffer plate. However, fibroblasts from hearts that have undergone the TAC process are unresponsive to being put on a 2 or 8 kPa plate, and remain activated even if the stiffness of the plate is reduced. This shows the prolonged effect of having chronic PO. We used western blotting to look at the production of collagen from the 2 and 8 kPa plates for the control non-TAC and TAC.
Keywords: pressure overload, hemodynamic overload
Social Impact: Health Care

Isaac Sosa
Roosevelt University

Oxyrrhis marina Grazing Rate Response to the Introduction of External Nutrition Sources

Natural vitamin concentration is difficult to measure in marine communities because of constant nutrient cycling. Vitamin B1 is a key nutrient for all life, including the algae that makes up a large, foundational part of marine communities. Communities of algae are responsible for contributing upwards of 70% of the oxygen in the atmosphere. Changes in nutrient availability in the surrounding environment can influence the grazing patterns of some species of plankton. *Oxyrrhis marina* (*O. mar*) is a species of plankton that functions as a grazer, feeding on other smaller species by endocytosis. Heterosigma akashiwo is a species of plankton that is primarily a prey source for grazers; it's mixotrophic nature does allow it to ingest bacteria for nutrition. In this experiment we introduced a 500 pM concentration of additional HET, a precursor of vitamin B, into the environment surrounding a mix of grazers and prey. We monitored for changes in the growth rate of prey, and by association grazing rate of predators, that could have been due to the increased presence of nutrients in the environment. We took samples at 0 hours, 24 hours, and 48 hours, after introducing the two species into their environment. From our experiment we hope to find the answer to whether O.mar will have its grazing rate on Heterosigma altered when an outside source of nutrients is introduced into the environment.
Keywords: plankton, algae, marine, vitamin, predation, nutrients
Social Impact: Health Care

Jiordan Washington
Michigan State University

The Effective Dosage of Ketamine in Healthy and Colic Horses

Ketamine is the main drug given to animals to induce anesthesia when getting procedures done and the most common dose is 2.2 mg/kg. Usually, the amount administered is often times higher than what was calculated to achieve an appropriate plane of anesthesia. This is important to determine because it would be helpful to avoid many complications during a procedure. This study directly involves all breeds of equine, large animal veterinarians, and vet anesthesiologists. In this study, we hope to determine the most effective dosage of ketamine to induce general anesthesia in horses and to determine if there is a difference in dosages between healthy and sick (colic) horses. We are also looking to see if breed has any effect on the dosage determined. This study will be done by pulling past medical records from Michigan State University Veterinary Medical Center of horses who have gone under anesthesia during a procedure. This is a retrospective study. We examined over 200+ anesthesia records from healthy and sick (colic) horses that underwent anesthesia while getting a procedure done to determine the dosage of ketamine that was calculated compared to the ketamine dosage that was actually administered during the first 20 minutes of induction of general anesthesia. The average dosage of ketamine used to induce general anesthesia in healthy and in sick (colic) horses was

both 2.8 mg/kg. There was no significant difference among horse breeds for the amount of ketamine needed for induction. From our results, we found that healthy horses and sick (colic) horses both received a higher dosage of ketamine from the calculated dosage of 2.2 mg/kg. There was no difference in ketamine dosage that was actually given to healthy and sick (colic) horses to induce general anesthesia before procedures. There was no difference between horse breeds.

Keywords: well being, anesthesia
Social Impact: Health Care

Keyana Blake
Michigan State University

Comparative Gene Expression Analysis of Duplicated Glutamate Receptor Genes in the Brains of Zebrafish and Spotted Gar

The teleost fish zebrafish (*Danio rerio*) is an important biomedical model species, but due to an ancestral teleost genome duplication (TGD), it can be challenging to characterize gene function and make connections to the human genome. Over evolutionary time, ~80% of teleost gene duplicates have been lost (non-functionalization), and the remaining single gene serves the primary function. However, metabotropic glutamate receptor (grm) genes have a particularly high rate of retained duplicates from the TGD (~70% were retained). Metabotropic glutamate receptors regulate synaptic transmission and can be drug targets for many neurological disorders, so it is essential to understand how these grm duplicates evolved. Generally, retained gene duplicates are thought to evolve by neo-functionalization (gain of new functions) and/or sub-functionalization (distribution of ancestral functions among duplicates). To identify the functionalization of grm genes before and after the TGD, we analyze spotted gar (Lepisosteus oculatus), a non-teleost fish outgroup that did not undergo the TGD. Gar thus can be used as a proxy to the pre-TGD condition to identify the mode of genome functionalization in teleost like zebrafish. Using RNA in situ hybridization on fish brains, we aim to identify the gene expression of grm duplicates in zebrafish and compare it to the single grm gene in spotted gar to make inferences about the type of functionalization of grm gene duplicates in teleost. Our results will not only identify the expression patterns of grm genes in two important biomedical model species but will also broaden our understanding of genome duplication and its evolutionary potential.

Keywords: glutamate receptor gene expression, evolutionary potential, Zebrafish, Spotted Gar
Social Impact: Environment

Michelle Stevens
Beloit College and Michigan State University

Using Archived Data to Recommend Best Management Practices for Reducing Phosphorus Contributed to Lake Erie From Ohio's Sandusky Bay Tributaries: Little Muddy Creek

Nutrients that flow into lakes and rivers come from various identifiable and nonpoint sources. Residential, urban, forested areas, and agricultural grounds all contribute to nutrient loading into major water bodies. Agricultural surface runoff and tile drainage, particularly problematic to the issue of environmental degradation and eutrophication, or nutrient enriched algal decay. It is from the application of fertilizers, manure, and certain landscape practices, after irrigation and saturation of the soil, that result in ultimate accumulation of excess nutrients to a watershed. Environmental degradation due to eutrophication is a major obstacle to farmers' profits and maintaining proper ecosystems, as well as their services. Since the conception of the Great Lakes Water Quality Agreement in 1972, for which the protocol was placed to maintain the water quality integrity of the Great Lakes, the phosphorus nutrient pollution issue has shifted from bonded particulates and their point sources, to the nutrient dissolved form, orthophosphate. A form of phosphorus largely contributed by non-point sources, it is a more readily bio-available limiting nutrient for algae and their blooms. In this project, I assess available archived data to explore reasonable efforts to reduce nutrient loading in the Western Lake Erie subwatershed HUC 04100011 1403, Little Muddy Creek, Ohio.

Keywords: Lake Erie, best management practices

Social Impact: Environment

Netanya Dennis
North Carolina Central University

Understanding Neuropsychological Disorders in the Workplace Post COVID-19

Since the COVID-19 Pandemic these rates of neuropsychological disorders (ie. Depressions, anxiety, eating disorder) have drastically increased. Before the beginning of the Pandemic about 18.4% of adults in the US had been diagnosed with a mental health condition (MHA, 2018), and about 8.4% of those adults 18 and up (NIH, 2020) were diagnosed with Major Depressive Disorder. Approximately 18% of adults will have a anxiety related disorder and about 28.8 million or (9%) of Americans will experience some form of an eating disorder in their lifetime. Now, nearly 50 million (19.86%) of adults in the US have been diagnosed with some form of neuropsychological disorders. African Americans are less likely to report have been mental health conditions but have seen an increase in major depressive episodes; the most drastic change being from 6.1% to 9.4% in young adults (18-25) (MHA, BIPOC mental health, 2018). The most drastic change seen in years. African Americans and other minorities have also experienced higher rates eating and anxiety related disorders but are half as likely to be diagnosed or treated when compared to non-Hispanic whites. With African Americans making up 13% of the American population and as we take steps back to normalcy with people rejoining the work force what are the challenges that these people will face? How can human resource providers and mental health professionals address these mental health disorders and help individuals live in this new world of work? Using archived data on neuropsychological disorders and work trends before and after Covid-19, this paper will help human resources and mental health professionals learn about neuropsychological disorders and create environments conducive for work productivity among this population. The second purpose of this paper is to aid in understanding the intersection of race and mental health stigma for people of color with neuropsychological disorders entering the work force and seeking treatment and services. Lastly, we aim to provide mental health and human resources professionals best practices to help those with neuropsychological disorders return to the work and be productive whether they be in office or virtual.
Keywords: neuropsychological disorders, depression, anxiety, eating disorder, workplace
Social Impact: Health Care

Oscar Juvera
University of Chicago

Caenorhabditis elegans as a Model for Host-Pathogen Interactions

The nematode *Caenorhabditis elegans* is a widely used multicellular model organism for biology research. It is routinely cultured on agar media feeding on a lawn of bacteria *Escherichia coli* strain OP50. When *C. elegans* is transferred from OP50 to a lawn of human bacterial pathogen *Pseudomonas aeruginosa* strain PA14, its intestine gets colonized and dies over a course of several days. This has been developed into a Slow-Killing assay to study host-pathogen interactions, including both host defense systems and bacterial virulence factors. *C. elegans* enzyme RDE-3 catalyzes the addition of alternating uridine and guanosine nucleotides to 3' ends of RNA. This process is required for the production of small RNAs necessary for RNA interference. It is unknown if rde-3 null mutant of *C. elegans* responds differently to PA14 infection compared to wildtype. *Achromobacter xyloxosidans* is a causal agent of hospital-acquired infections that occasionally are co-isolated from patients infected with *P. aeruginosa*. Whether *A. xyloxosidans* is pathogenic *towards C. elegans* has not been studied before. In this study, we performed Slow-Killing assays where the *C. elegans* wildtype strain N2 and rde-3 mutant were exposed to *P. aeruginosa* strain PA14 and *A. xyloxosidans* strain KM543. We found that rde-3 mutant is more susceptible to PA14. By 100 hrs after exposure, 100% rde-3 mutant worms were dead while 18% N2 worms survived, which all died at 120 hrs. Notably, neither the wildtype nor the rde-3 strain of *C. elegans* were killed by *A. xyloxosidans*.
Keywords: *Caenorhabditis elegans*, *Pseudomonas aeruginosa*, PA14, slow killing, pathogenesis
Social Impact: Health Care

Oyinloluwa Akande
Dillard University

The COVID-19 Pandemic and Moral Distress in Nursing

The COVID-19 pandemic magnified foundational issues within the United States (US) healthcare system that it was woefully unprepared to handle. Nurses, in particular, bore the brunt of the pandemic's impact, providing round-the-clock care to patients without the necessary equipment to protect themselves. As a result, reports of moral distress (MD) symptoms increased. The definition of moral distress is the inability to take ethically correct action. MD comes in internal and external forms and profoundly affects an individual's core values. These feelings can manifest as physical, emotional, psychological, or spiritual symptoms. This project seeks to determine the average amount of moral distress nurses felt during the pandemic using the Moral Distress Thermometer (MDT), a 0-10 scale. It also aims to understand the lived experiences of nurses during the pandemic and the specific situations that caused them Moral Distress. To address these aims, this study utilizes a mixed-method approach. We hypothesize that the average number of MDs reported will be eight on the MDT. We also hypothesized that certain situations unique to the pandemic caused MD in nurses. Fifteen nursing professionals across California, Louisiana, Texas, Michigan, and Maryland were virtually interviewed and asked to complete the MDT. We found that the average levels of moral distress were a six on the MDT. In addition, qualitative analysis revealed that the pandemic caused unique experiences and feelings that cause MD, such as the fear of bringing the virus home to family members. The results of this study could trigger reform and policy changes, including creating PPE stockpiles, emergency ventilator stores, and earmarked funds for undersupplied hospitals.
Keywords: nursing shortage, moral distress, COVID-19
Social Impact: Workforce Development

Saadiya Jackson
University of Minnesota and Howard University

From Menthol Cigarettes to Synthetic Nicotine Products: Tobacco Product Regulatory Loopholes and their Potential Implications for African American Communities

FDA proposes to ban menthol cigarettes, which the tobacco industry is lobbying against by claiming the ban would discriminate against African American (AA) consumers. Another challenge to the FDA is synthetic nicotine products (SNP), which companies used to skirt FDA regulation due to being “tobacco-free”. Not much is known about SNP and its role in the menthol cigarette ban. The literature review and PhotoVoice method illustrated the industry’s marketing of menthol cigarettes to AAs, the emergence of SNP, and the role SNP may play in the menthol cigarette ban. Historically, marketing of menthol cigarettes relied on Black ethos to attract AA consumers. Cooling agents (WS-23, WS-3) similar to menthol in cigarettes are present in SNPs including the popular PuffBar. The emergence of SNP with menthol qualities may encourage AA menthol cigarette users to switch to menthol-like SNPs instead of switching to non-menthol cigarettes following a menthol ban. The SNP industry may also rely on historical AA targeted marketing strategies to attract AA non-smokers. SNP with menthol qualities will likely attract AA consumers impacted by a menthol cigarette ban, which could be beneficial over smoking non-menthol cigarettes. Regulation of SNPs will be critical to ensure AA non-smokers are not also attracted.
Keywords: public health, tobacco, nicotine, addiction, menthol cigarettes, synthetic nicotine, African Americans
Social Impact: Health Care

Sihan Bu
Michigan State University

The Mediating Role of Early Life Gut Microbiota and Infant Feeding Method in Neurodevelopmental Outcomes

Purpose: To determine whether the relationship between infant feeding practice and neurodevelopment is mediated by the gut microbiota.
Methods: Stool samples were collected from infants aged 3 months. Microbiome analyses were based on 16S rRNA gene sequences. Neurodevelopment was assessed at 9 months of age using the Ages and Stages Questionnaire 3rd edition.
Outcomes: The richness and evenness of infant gut microbiota was positively associated with problem solving score. The gut microbiota composition was associated with fine motor and problem-solving score. Exclusively breastfed infants had higher ASQ-3 score, especially increased fine-motor and problem-solving scores, compared to partially breastfed and formula-fed infants. Gut microbiota at 3 months of age mediated the relationship between feeding practices and problem solving.
Impacts: This study significantly deepens the fundamental understanding of the mechanisms linking infant feeding method and infant neurodevelopment. Key microbes identified by this study will serve as biomarkers for future studies to evaluate the impact of probiotics or other interventions on gut colonization and infant neurodevelopment.
Keywords: infant neurodevelopment, gut microbiota, breastfeeding
Social Impact: Health Care

Yvan Pacheco
University of Puerto Rico-Humacao

Expression Atlas of Individual Cells Within the Blood Brain Barrier

The Blood-Brain Barrier (BBB) is a filtering system that prevents toxic and pathogenic molecules in the blood from entering the central nervous system (CNS). Part of the problem is that the BBB also prevents potentially beneficial medicines from being able to cross into the brain. Endothelial cells, astrocytes, and pericytes are the main components of the BBB and are responsible for its proper function. Endothelial cells and pericytes perform specific roles when part of the BBB, relative to when they are found in different areas of the body. We attempt to understand whether they have differential expression profiles unique to the BBB. In this study, we perform a literature review and leverage data from the Allen Brain Atlas to identify marker genes in each of these cell types. Then, we developed a strategy to look at over 1000 single cell experiments from mice and over 300 from humans, that include over 180 tissues and 5.5 million cells. We used the single cell sequencing data from the Panglao Database to screen clusters that overlap between endothelial cells, pericytes, and astrocytes within a Single Cell dataset of brain tissues. We have identified these datasets and in the future we hope to create matrices of the differential genetic profiles for the cell types across the regions of the mouse brain. Gaining abetter understanding of the BBB composition and function is important for future researchers interested in novel drug delivery therapies that are able to cross the BBB.
Keywords: blood brain barrier, endothelial cell, pericytes, astrocytes, marker genes
Social Impact: Health Care

Student Poster Presentation Abstracts
Virtual Location: Hopin
Social Science

Ami Brooks
University of New Orleans

Does Anger Appeals Affect Black Audiences Differently Than White Audiences?

African Americans and White Americans are likely to have different reactions to political anger appeals. We aim to analyze emotional responses from audience members as they react to anger and non-angering appeals to race-related and race-neutral speeches. A specific emotional appeal used successfully overtime known to invoke feelings of anger to achieve results with high efficacy, is known as anger appeals. Dr. Davin Phoenix found that though successful for the majority, anger appeals do not affect black audiences, and invoke feelings of resignation instead of anger. Though an interesting theory, it has not been systematically tested. We have devised an experimental survey study on Amazon Mechanical Turk (MTurk) to systematically test Dr. Phoenix's theory. We hypothesize that African American survey participants will display more feelings of resignation compared to their white counterparts who we hypothesize will respond with more feelings of anger.
Keywords: race communication, political communication, efficacy, political psychology, race-neutral
Social Impact: Social Equity

Asli McCullers
University of Delaware

Exploring the Pathway Between Racial Trauma and Hypertension Stratified by College or University Post-Secondary Educational Attainment within a Sample of African American Smokers

Introduction: Among African Americans, experiences of racial trauma, such as microaggressions, race-fueled violence and implicit bias have been studied to be a powerful factor in physical health outcomes such as hypertension. Little is known regarding how post-secondary educational attainment (i.e., college and university) may specifically modify this relationship in African Americans. Thus, we sought to compare the pathway between racial trauma and hypertension among African Americans with and without college university based post-secondary education. Methods: Data from a sample of 984 African American smokers participating in the Temple Lung Health Cohort Study were examined. The predictors of Racial Microaggression Scale (RMAS) score and level of education were ascertained from a participant completed questionnaire, while blood-pressure data was collected clinically. A logistic regression model stratified by educational attainment was used to assess the association between RMAS score and hypertension. Results: In an adjusted model, controlling for age, gender and carbon monoxide exposure, African American smokers with post-secondary education who reported a high RMAS score had 0.77 times the odds of having high systolic blood pressure when compared to those with a low RMAS score (95% CI: 0.26, 2.33). Meanwhile, for diastolic blood pressure, those with high RMAS scores had 0.44 times the odds of reporting high blood pressure in comparison to those with low RMAS scores (95% CI: 0.10, 1.99). In an identically adjusted model, African Americans smokers without post-secondary education who reported a high RMAS score had 1.30 times the odds of having high systolic blood pressure compared to those with low RMAS scores (95% CI: 0.77, 2.19). For diastolic blood pressure, those with high RMAS scores had 1.21 times the odds of reporting high blood pressure in comparison to those with low RMAS scores (95% CI: 0.45, 3.21, p-value <.05). Conclusion: Those without post-secondary education experienced a stronger relationship between racial trauma and hypertension compared to those with post-secondary education when controlled for age, gender and

carbon monoxide exposure. Extensive work to further unpack the pathway between structural racism, mental health and physical outcomes within diverse subgroups of the African American community are warranted by these findings.
Keywords: hypertension, education, African Americans, discrimination
Social Impact: Social Equity

Breland Steward
Oklahoma State University

How Mentorship's Affect Black Male Resilience

There are multiple barriers affecting the resilience of African American males at the collegiate level. The development of African American male-specific mentor programs at the collegiate level will help build resilience in African American males. Previous researchers have found that mentors play a vital role in student success. This research shows that poverty, discrimination, and social identity have affected African American male resilience the most over time. African American males who participated in this research use support systems of family, classmates, and the university faculty and staff to overcome their barriers. Without a reliable mentor at a young age, the collegiate experience can be affected negatively. After reviewing these sources multiple gaps in data regarding African American male resiliency were identified. Research shows redlining (discrimination based on demographic location) and poverty to be the main factors affecting resilience, and although they affect Black male resilience greatly, our research has shown the lack of positive mentors in a Black male's life can be identified as the underlying effect to their collegiate success. There are plenty of Black males that have experienced redlining and still been successful. Through in-depth analysis of resilience surveys, we identified if the issue was race-related or personal. We found that the issue is both race-related and personal. We also used personal interview methods to make an observative analysis that mentorships affect Black male resilience.
Keywords: poverty, redlining, male, resilience
Social Impact: Higher Education

Camila Monsalve Avendaño
Michigan State University

Revolutionary Love Helps Students Navigate Belonging to A Science Community?

Creating a sense of belonging requires a constant negotiation process for an individual. For students, with one or more marginalized identities, this process is particularly fraught when we consider the social aspects of learning during the transitioning from a community or across STEM fields. In this poster we will draw from the work of scholars who have explored this negotiation process for science learners (e.g. McGee, Ong, Secules, and Marco-Bujosa.) We will explore different perspectives of the tensions navigated as students who identify as Black, African American, Latina and/or as a woman negotiate belonging in science. We then explore how Valarie Kaur's Revolutionary Love framework explains folks' experiences of belonging in a university after transferring from a community college or across STEM fields.
Keywords: STEM careers, students of color
Social Impact: Higher Education

Edward Arnold
Tennessee State University

Institution-to-Institution Mutual-Exchange Marketing Model for Higher Education

The Institution-to-Institution Mutual-Exchange marketing model establishes a standardized certificate-based online course in diversity. The standards are based on the concept of Diversity Education Units as a measurable method for higher education institutions to comply with legal requirements for diversity and social obligations for diversity. This model combines the student base of participating higher education institutions to fulfill both the institution and student obligation and forms a process for accountability. In this model, higher education institutions form a Mutual-Exchange to where each participating institution shares in a pool of streaming revenue generated by participating institutions.
Keywords: institution-to-institution, mutual-exchange, diversity, equity, inclusion
Social Impact: Higher Education

Esonica Charles
University of the Virgin Islands

A Good 'tude Makes the Future Mood: Integrating Research to Improve Attitudes Towards Science

There is no one way to learn but learning is a multidimensional spectrum of integrating information to create new long-lasting connections. In the University of the Virgin Islands Albert A. Sheen Campus General Chemistry (CHE) 151 & 152 laboratory courses from Fall 2018 to Spring 2020; applied research was integrated into the curriculum. We hypothesized if applied research is introduced to the curriculum, then students should show a more positive attitude toward science. To test our hypothesis, we asked students in the courses to anonymously answer a Students Attitudes towards Science Technology Engineering and Mathematics survey. We administered the survey before and after the students conducted research in the laboratory during the semester. Results were collected and then analyzed using SPSS Analytics. A total of 87 students participated in the study. Our results showed that there was a significant difference ($p= 0.017$) in CHE 151 for the question "I will need science for my future work" However, there was no significant difference in students' responses in CHE 152 and when CHE 151 and 152 responses were combined. To conclude, only students in CHE 151 were impacted, and no statistical impact was made on students in CHE 152 ($p > 0.05$). Currently, there is no clear trend as to what changes in attitudes could be proved in this experiment. In the future, the plan is to increase students' attitudes toward science in upperclassmen, implement new strategies to enhance students' attitudes toward science and direct more students to STEM careers.
Keywords: STEM diversity, careers in science, applied research
Social Impact: Higher Education

Jahsun Hurley & Hennessy Garcia
CUNY Medgar Evers College

The Importance of the Urban Canopy in NYC and the Impact of Race, Wealth and Other Socioeconomic Factors

This history of the United States has been a tumultuous one rife with conflict and racism and this has leads to many issues today, with one being green areas and urban canopy. As a result of the civil rights movement and the push for equality for all, other areas of society also came under scrutiny. This has directly led to the examination of the environment and environmental justice and injustice. Inequitable distribution of green space and trees across metropolitan areas has been a hot button issue for many decades now. Due to the importance and quality pf life implications of a city's urban tree canopy it must be distributed in a way that benefits all who are affected by it. My research project will focus on the urban tree canopy of New York City and its impact on the people who live in the city. My focus will be to determine if there is a difference between the urban tree canopy cover in low-income minority neighborhoods and high income predominantly white neighborhoods, I will review environmental inequality literature focused on cities in the United States, but I will use available street tree data from New York City to test my hypotheses. Using street tree data taken from NYC Parks and demographic data taken from the NYC census I hope to see what the project will yield and how that reflects on the state of the city. I will be using this project to learn about methods used to determine if and where environmental inequities exist and/or create an approach that could be used in other cities.
Keywords: environmental justice, New York City, equity
Social Impact: Social Equity

Jasmine Benner
North Carolina Central University

Assessing the Effectiveness of Theater and Standard Lecture: Increasing COVID-19 Knowledge and Reducing COVID-19 Vaccine Hesitancy among HBCU College Students

COVID-19 nationally has infected 92.8 million people (New York Times,2022). African Americans account for 13% of those infected (KFF,2022). Studies also indicate that African Americans report higher rates of vaccine hesitancy than any other groups (Tasleem J. Padamsee, 2022). This disparity is due to historical fears of the medical healthcare community (Hostetter & Klein, 2021). To increase knowledge and address fears among African Americans populations, healthcare communities have employed a number of prevention and intervention strategies. Ethnodrama or theater is a new innovative health promotion and education tool proven effective in increasing knowledge and encouraging behavior change among the African Americans (Hart et al., 2022). Thus, the current study will assess the effectiveness of theater and standard lecture in educating Historically Black College and University students on knowledge of COVID-19 and reducing vaccine hesitancy. Employing a pre-posttest two group design, over 300 students will be recruited to participate in either the theater intervention or standard workshop intervention on COVID-19 knowledge and vaccine hesitancy. Independent sample t-test will be used to investigate difference in knowledge and vaccine hesitancy for both theater and workshop groups. Paired sample t-test will be used to investigate increases in knowledge and reduction in vaccine hesitancy for both groups after each intervention. Given the high rates of COVID-19 in African American communities, and that many HBCU's are located in high risk Black communities, there is a need to develop interventions increasing knowledge about viruses and cultivating better relationships between the medical and Black community.
Keywords: COVID-19, vaccine hesitancy, HBCU
Social Impact: Health Care

Jazmyne Abney
North Carolina Central University

A Parent's Place on Social Media: Positive Discipline and Gentle Parenting Content

Gentle Parenting is a term credited to Sarah Ockwell-Smith, a British childcare expert, to describe a parenting style based in mutual respect and boundaries between parents and their children. Gentle parenting is itself a new term but is a variation of the Authoritative parenting style. This abstract proposes an exploration of factors that may be contributing to the prevalence of positive discipline and gentle parenting related social media content. Since March 2020, the Covid-19 Pandemic has presented endless challenges. American families continue to endure economic, political, and social uncertainty while making efforts to remain healthy. The effect of such uncertainty is exacerbated by disruption to daily routines as a result of lockdown and quarantine practices imposed in some localities. Through and the rise of new platforms, people are using social media as a tool to disseminate information and remain connected now more than ever. This can be observed through the prevalence of, and interest in, social media content related to positive discipline and gentle parenting practices.
Keywords: gentle parenting, social media
Social Impact: Family Relations

Joshua Grant
North Carolina Central University

COVID-19 Impact on Labor Demand in the U.S

The COVID-19 pandemic has ultimately changed how organizations view work and careers, leading to significant shifts in the workforce (COVID-19 Pandemic Continues to Reshape Work in America | Pew Research Center, 2022). Currently, over 3.8 millions of highly skilled and educated Americans have left the labor market (Wallace et al. 2021). Moreover, a substantive number of skilled labored positions in the U.S have gone unfilled. As Americans try to recover from the pandemic, rising inflation and economic uncertainty due to global unrest, it is of key importance that industrial organizational psychologist and human resources researchers began to assess how the formation factor has influenced the U.S workforce since 2020. To help the post-pandemic labor force and workplaces recover, this presentation will address how thepandemic affected demand for skilled laborers and how the Great Resignation influenced the employment for skilled laborers. Archival data from business and industry over the past three years will be evaluated. Data on resignation and job change, as well as reason for leaving current job will be collected. Data on trends and growth in businesses with high demand for skilled laborers will be collected and evaluated. Given the economic uncertainty that the pandemic has caused, there is a need for industrial organizational psychologists to understand the significance of the great resignation and cultivate educational and career training pathways for the skilled labor market. Such an endeavor is critical given shifts in economy and global unrest.
Keywords: labor market, workforce, skilled laborers
Social Impact: Workforce Development

Kaetlin Marsh
University of North Texas

The Effects of Prosocial Behavior and Parental Monitoring on Parent-Child Agreement of Disordered Eating Behaviors

Although eating disorders (ED) can occur at any age, they are most commonly associated with adolescence. However, less than half of children with a lifetime ED receive psychiatric treatment. Detection is one of the biggest barriers to treatment. The purpose of this study is to examine how parental monitoring (PM), which is associated with decreased odds of ED behavior, and a child's prosocial behavior (PS) effect parent-child agreement on disordered eating behaviors (DEBs) . To accomplish this purpose, I will analyze data gathered through questionnaires and the DSM-5 diagnostic interview from the ABCD study. Participants will be children (M: 12 years; SD: 0.66 months) and parents from the second year follow-up. Results could have implications on clinical screenings, as parent's disclosure of psychiatric symptoms is often vital to ED diagnoses.
Keywords: disordered eating behaviors, prosocial behavior, parent-child agreement, parental monitoring
Social Impact: Family Relations

Lilli Xiang
University of North Texas

Post-Roe USA: Exploration of Identity Variables in Experiencing Gender Microaggressions

Previous literature suggests that experience of gender microaggressions is associated with greater psychological distress (Gartner et al, 2019). However, the magnitude of this relation may vary by one's gender and endorsement of feminist values yet no published studies can be located that address the interaction effects. This study will examine the possible three-way interactions among gender microaggressions, gender identity, and liberal feminist ideology as well as their unique impacts on psychological distress and sense of belonging (SOB) among college students. Experiencing gender microaggressions (IV) is hypothesized to predict higher levels of distress and lower SOB (DVs). Furthermore, gender identity will moderate the IV-DV relations, with gender microaggressions showing stronger effect for women than for men. We also predict that endorsement of liberal feminist attitude will serve as a second-tier moderator, as those (in both female and male subsamples) who have greater endorsement will be more affected by gender microaggressions.
Keywords: gender identity, gender microaggressions, sexism, feminism
Social Impact: Mental Health

Melissa Ceren
Columbia University

Exploring the Arts, Culture, and Sustainable Creativity among Urban Developments in NYC

New York City Housing Authority (NYCHA) arts, cultural, and gardening programming are the perfect epitomes of the history of NYCHA. The willingness of its citizens allows to improve the quality of life for not only their families but as well as the unique characteristics of their developments and surrounding neighborhoods. Even though, NYCHA has been historically recognize for structural segregation— there are nonprofit organizations partners such as community gardening. For instance, sustainable community environments provide students and residents to learn more about biology and other STEM topics. Additionally, provide a critical connection on how low- and moderate-income residents often the most-affected by the lack of climate, and food resiliency funding—affects them either negatively or positively. To students in particular, contributes with critical data of the importance on having green spaces designed for and by

the community within an urban environment. However, due to the cut funding of NYCHA developments because of the COVID-19 pandemic, arts and cultural programming have been ceased. Therefore, the purpose of this study is to investigate the benefits and costs of arts and cultural events in New York City 's public housing. In particular, the following questions will be investigated: (1) why is there a lack of funding in art and culture events that can include sustainability methods in NYCHA development? (2) how can arts and cultural programming impact physical and mental health outcomes in youth development?

Keywords: arts and cultural integration, economic stability, youth development, sustainability, community resilience
Social Impact: Environment

Negineh Asef
Westminster College

Bacha Bazi: A Critical and Sociological Look at the Practice of the Dancing Boys in Afghanistan

The practice of Bacha Bazi also known as the dancing boys is common in Afghanistan today and has been for many decades. This practice is characterized by powerful warlords, politicians, or men who have a higher status in this society, targeting impoverished young boys. The young boys are susceptible to falling into the cycle of being sexually exploited as they are promised money to support their families. The owner of these boys take them to men's parties or weddings to dance, and often after the party, they are passed around to different powerful men and are sexually assaulted. The research on Bacha Bazi is minimal as this topic is very stigmatized, due to society's unacceptance of homosexuality. The majority of research that is done takes place outside of Afghanistan. This presentation uses a secondary analysis to examine multiple sources on this practice, including human rights reports, documentaries, and investigative journalism to understand the social and structural forces that enable and perpetuate this practice. The findings of this research reveal social and structural factors that contribute to this practice, including societal changes that need to be implemented to end Bacha Bazi. Further research on this topic requires more research and coverage inside Afghanistan to bring recognition and significance to this issue and eventually abrogate Bacha Bazi.

Keywords: human rights, trafficking, pederasty
Social Impact: Criminal Justice Reform

Ramina Nikola
Roosevelt University

Queen of Manipulation

History has shown it was a rarity of this time for a female to assume the throne as a monarch. Even though she was the political leader of England, as a single woman at a time when prescribed gender roles for women were highly restrictive, Elizabeth walked into a nearly impossible world. Her reign represents a unique moment in time during which there was tension between rigid ideas of normative gender roles for women and the demands of holding high political office. This type of study is relevant to contemporary society, as, nowadays, female political leaders continue to negotiate the tension between their exercise of power and the constraints of normative gender expectations. The purpose of this study is to understand how Queen Elizabeth I manipulated gender during her reign to present an image that is both masculine and feminine. This investigation will be done by reviewing the most updated academic literature and journals, such as The Heart and Stomach of a King by Carole Levin; The Cult of Elizabeth by Roy Strong; and Elizabeth I Ruler and Legend by Clark Hulse. This study will ideally provide a deeper insight into the historical intersections that are constantly being found between gender and power.

Keywords: Queen Elizabeth I, gender, tudor, England, monarchy
Social Impact: Social Equity

Tarshana Kimbrough
Roosevelt University

The Influences of Mental Health on College Students: Understanding Help-Seeking Barriers

Mental health struggles are pervasive among American undergraduate college students. The research question in this study is What barriers influence college students' likelihood to seek mental health services and treatment? The purpose of this study is to gain a deeper understanding of the students and the reasoning for why they avoid seeking mental health services. This interpretive method of study allows for the analysis of the personal experiences of college students through a qualitative survey that is designed to assess the barriers and experiences to seeking mental health services for American Undergrad College Students between ages 18-25 from the following Grand Rapids Colleges: Aquinas College, Calvin, and Cornerstone University. Scholarships on mental health in college students have studied students in this age range in a variety of places in the United States. As college students in America, we wanted to gain more insight on the mental health seeking barriers among this population in the area of Grand Rapids. Additionally, we wanted to look at populations that also came from a variety of faith college campuses that have a large workload and undergo independently created structures of academic, social, and work experiences. Mental health has become a major issue among college students in America. As college students in America, we want to understand this population more and to gain more insight into the mental health-seeking barriers among this population in the Grand Rapids area. Findings indicate that undergraduate students who struggle with mental health are more likely to avoid seeking mental health services due to the role of stigmas associated with mental health and seeking health for mental health concerns; cultural perceptions on mental health that are often associated with race and ethnicity also play a huge role in this. Moreover, factors of gender also impact students' decisions to seek mental health treatment in addition to the lack of overall knowledge about mental health services, particularly those available on college campuses.
Keywords: mental health, utilization, access to services
Social Impact: Mental Health

Yasmin Landa
University of Washington

The Effects of Inpatient Psychiatric Socio-Physical Experience on Post-hospitalization Treatment

The deinstitutionalization of massive psychiatric hospitals occurred in the 1970s and 1980s moving the field towards moral treatments by focusing on improving physical and social environmental aspects in psychiatric hospitals. It aided in the transition of prison-like hospitals into modern-day ones. Much has been done to improve psychiatric facilities within these environmental areas, but there remains area for growth if the psychiatry field aims to engage and provide patients with more effective treatment. This research explores the relationship between a patient's social and physical experience in a psychiatric hospital and their engagement with mental health treatment after discharge. It analyzes the physical environment of a psychiatric unit and explores mental health professionals' views on guidelines for maintaining a therapeutic environment in these spaces. Using qualitative methodology, including ethnographic observations, photographs, and interviews, I provide an analysis discussing the environmental factors of psychiatric rooms through the evaluation of room design and its effectiveness in creating a therapeutic environment. Preliminary findings point to a negative relationship between a patient's socio-physical experience in an inpatient psychiatric facility and their engagement in future treatment after discharge. Additional research findings will enable mental health providers to better understand the relationship of socio-physical aspects in psychiatric hospitals to the continuation of a patient's treatment after discharge. This information will help providers improve upon these experiences and increase a patient's receptivity to post-hospitalization treatment.
Keywords: mental illness treatment
Social Impact: Mental Health

Discussion Notes:

Discussion Notes:

What is AGEP?

The Alliances for Graduate Education and the Professoriate **(AGEP)** is a National Science Foundation program that supports recruitment, retention, and graduation of underrepresented U. S. minorities in doctoral programs of the natural and social sciences, mathematics, and engineering. Undergraduates, graduate students, post-docs, and faculty who participate in building the AGEP Community at MSU rise to meet the challenge of Diversity, Equity & Inclusion (DEI) at U. S. colleges and universities, by nurturing and developing world-class STEM and Social, Behavioral and Economic (SBE) sciences faculty members who fully reflect the diversity in race, gender, culture and intellectual talent of the U. S. population.

National Need

The United States faces a growing demand for a highly educated science and engineering workforce. The annual number of Black, Hispanic, and American Indian citizens earning a PhD must quadruple in order to contribute the science and engineering talent necessary for the U.S. to become self-reliant.

AGEP at Michigan State University – Impact

The MSU AGEP Community represents 75% of doctoral students at MSU who are Black, Hispanic or American Indian citizens that in NSF sponsored departments. Ninety percent of the AGEP Community graduate student participants complete an advanced degree. Over the past 10 years, the AGEP Community has grown from six graduate students in 2006 and faculty to over **250** participants annually with over **400** alumni nation-wide.

The MSU AGEP Learning Community began with support from NSF, and AGEP has become a self-sustaining component of the matrix of graduate student support provided by the MSU Graduate School. A cross-disciplinary AGEP Learning Community of graduate students and faculty meets monthly; discusses active research by participants using everyday language; and considers current topics of regional and national importance for public policy. AGEP is a proven strategy for diverse recruitment, retention, and persistence in graduate education.

For more information, visit us at:

MSU AGEP website: https://grad.msu.edu/agep
MSU AGEP Program Director: Steven Thomas, deshawn@grd.msu.edu

MSU GRADUATE SCHOOL

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