Student Abstracts
CrossTalks & Posters

CrossTalks: 18 Student Oral Presentations
8:15 AM – 10:30 AM
Room 104 AB with Facilitator: Dr. Abdifatah Ali
Room 105 AB with Facilitator: Dr. Isola Brown

Poster Session: 45 Poster Presentations
1:20 PM - 2:30 PM
Big Ten Room A

MICHIGAN STATE
UNIVERSITY

Student Oral Presentation Abstracts
Room 104 AB

Grace Gerloff
Michigan State University

Becoming the Eggroll: Negotiating Adoption and Identity Through Food

This autoethnographic research asks what it means to be a transracial Chinese adoptee (of Chinese descent but adopted and raised by a white family) in the United States and how engaging with aspects of culture, such as food, can lead to a more nuanced understanding of what it means to exist and build identity in a liminal space. Many Chinese adoptees in the U.S., myself included, were adopted as infants as a result of the One Child Policy and have little or no memory of life before adoption resulting in their knowledge of their birth culture being mediated through a white, Western narrative. Caught between a homeland they never knew and a country that constructs "authentic" Chineseness in Orientalist and essentialist terms makes fostering a connection with the culture of one's ancestral homeland a complicated and challenging journey that many adoptees face alone. In this research, I explore the colonial effects of transracial of Chinese American adoption and my own processes of cultural identity making by putting myself into conversation with food as a source of cultural and historical knowledge production. By using autoethnographic methods to engage (by way of cooking) with food from my own ancestral homeland of the Zhejiang province of China, food has created a space in which I have been able to grapple with the nuances of my adoptee identity.

Kaelyn Sanders
The Ohio State University

Dissimilarities Between Fatal and Non-Fatal School Shootings

School shootings are a phenomenon that has been going on for many years now, but in the past couple decades, people as well as the media are paying increasing attention to them. The Columbine High School shooting in April 1999 was the catalyst for the rise in conversation because of the severity and surprise of the attack. Now, society is trying to figure out how to identify threats early on since the amount of attacks appear to be rising in frequency. Even though there are many debates on how to define school shootings and their causes, the body of research on shooters and cases studies of the events is growing, but the data is still lacking. Current research completely ignores nonfatal shootings and the school's role, which is essential to fully understand why shootings occur and identify preventive measures. This is why the school's environment must be examined to see how it influences the shooter and amount of fatalities alongside the shooter's characteristics. Through SPSS, a secondary analysis of 377 coded cases from the United States School Shooting Database (SSDB) was conducted to see what perpetrator and school characteristics differ between nonfatal and fatal school shootings to identify potential areas of prevention and intervention. Study results showed that certain perpetrator and school characteristics influenced whether or not the shooting was fatal. The results can be implemented with society to better prevention and intervention methods.

Sandra Sparks
Kansas State University

Values and Voting: Understanding Political Engagement in the Modern Day

This study began as a quantitative analysis of fundamental human values and the voting behaviors of college undergraduates. What it evolved to be is a qualitative critique of the current research methods used to understand political participation, and a call to action for the development of a measure for the extent to which a person has the sociological imagination. This study's original intention was to explore political participation among college students at a large, public Midwestern university through the lens of Johnathan Haidt's Moral Foundation Theory (MFT). Secondarily, this relationship was to be contextualized through an experimental scale measuring the extent to which a participant could see and understand their impact on social structures. First, it was hypothesized that participants who measure high on any one value would participate in politics more than participants that who measured more neutral. Second, I hypothesized that there would be no significant difference in correlations with political participation between all five values. Finally, I hypothesized that those who had the most political participation would also measure higher than other participants in their level of sociological imagination. Through the process of conducting this study, it became clear that there is a distinct gap within sociological literature that would do a disservice to the analysis of the data collected for this project. A measure of the sociological imagination is necessary to understanding the intentions of participants when they take part in political actions; It is those intentions which differentiate two people with the same values but vary intensely as to why they are acting.

Magdelene Thebaud
Northeastern Illinois University

Intimate Partner Homicides: Has the Increase in Mandatory Arrest Laws Been Counterintuitive for the Very People they were Set Out to Protect?

Battered women have had to deal with a great rise in violence once mandatory arrests were decided on their intimate partner. The determination of the police to arrest the abuser was not always made with their best intentions. The motivation to arrest the abusers would often stem from the pressure of liability. Often times the police racially profile the victims and the abusers which may result in a dual arrest or unwillingness for victims of domestic violence to contact the police. This study refines our current understanding of the certainty of arrest in relation to domestic violence occurring after the initial report was made. Using quantitative research methods and secondhand data, I will be analyzing race, socio-economical status, homicide rates, and state statutes on mandatory arrest regarding domestic violence. My preliminary results give a better illustration of what causes a deterrence of reports by victims based off of statistical analysis. In addition, we look at how the increase in mandatory arrest laws have been counterintuitive for the very people they were set out to protect. Furthermore, I discuss the implications of policy regarding mandatory arrest laws of color.

Franklin Nwoko
Northeastern Illinois University

Security Dilemma between the West African Nations and the United States

Security related issues are major challenges West Africa nations faced since the rise of Islamic State (IS), Boko Haram, and other terrorist groups within the region. Security threats, as defined by the U.S, has led them to the creation of the Global War on Terrorism (GWOT) strategic and Africa Command (FRICOM). The U.S presences in the region has prompt a catalyst of security dilemma between the West African nations on who will have the solar security control. This security dilemma causes states to worry about one another's future military intentions and relative power.
The purpose of this research is to explore factors that led to the current West Africa security dilemma and offer solutions to avoid increasing militarization of the zone. This research uses academic scholarly articles (primary) and international and national newspaper articles (secondary) to analyze U.S military intervention in the West Africa. It also looks at International Humanitarian efforts on the region to document indigenous and military conflict caused by security dilemma. Literature review highlights that West African nations have witnessed how the US military presence could infringe in their relationship with other local State actors, in terms of security and economic processes. The preliminary results show that the United States military presence in the west African countries triggers military, and nonmilitary conflicts among Africans and the U.S. troops. For example, some experts discuss how the continuing confusion surrounding the U.S. military presences in West Africa lead to the recent Niger soldiers killing of some U.S. services men.

Jonathan Dudley
Beloit College

The Evolution of Black Power: The Ongoing Black Power Movement

This is a paper that briefly discusses the miseducation of the meaning of Black Power. It introduces a new meaning of Black Power by telling the story of three Black American activists in three distinct Black Liberation Movements; Arguing that at the core of their ideals and movements sits the unifying principle of Black Power. This paper presents three Black U.S. Liberation Movements of the 20th and 21st centuries (Marcus Garvey's Pan-African Movement, Civil Rights/Black Power Movement, and Black Lives Matter Movement) as three phases of a single movement that is called The Ongoing Black Power Movement. Throughout this movement, the events of American history that have caused violence toward Black people also serve as three distinct wake-up calls to Black Americans to respond to white supremacy, degradation of self, and state violence. Each wake-up call is the beginning of each Phase within the Ongoing Black Power Movement. The overarching theme of the wake-up calls in each phase is this call for Black people to 'awaken' or 'get woke' and strive to dismantle a society historically embedded with white supremacist ideologies by using Black Power as a form of social change. The narrative of the Ongoing Black Power Movement is one of great intrigue because its validation and story is embedded in the collective ideals and narratives of Black American activists that have and still strive to achieve Black Power and equity today.

Alyssa Lopez
Michigan State University
"Crazy About Moving Pictures": Black Adolescent Girls, Moviegoing, and the Archives

Moviegoing practices are central to cinema history, as they reveal the sometimes-hidden influence of other cultural and social institutions on the lives of spectators. Black moviegoing, for example, cannot be understood without an eye towards the centrality of surveillance and exclusion of black people in American society. Drawing upon research in government and institutional records, this paper explores how young black adolescent girls in New York City engaged with movies and theatres between 1900-1935. "Crazy About Moving Pictures" also discusses the ways that seemingly inaccessible lives can be found in unexpected archives. This paper examines these black girls' attempts to use the movies as a means to experience entertainment and independence. Bedford Hills Correctional Facility and the Women's Prison Association, a prison and reform agency, respectively, conducted lengthy interviews with their charges that uncover moviegoing practices that included treating, prostitution, skipping work and staying out late. While "Crazy About Moving Pictures" endeavors to recuperate its subjects' voices from unlikely sources, particularly those that are hostile, paternalistic, and racist, it also points to the ways that the archives are marred with familial and community expectations and control. Parents often restricted or chaperoned their children's moviegoing, while reformers and employers sometimes aligned moviegoing with immoral activity. Thus, this paper ultimately seeks to expand the historical scholarship on moviegoing by centering the hereto unexplored experiences of black adolescent girls in New York City, framing them through the dialectic of surveillance and independence.

Kevin Calhoun
Michigan State University

Syllabus Content Analysis: What Are We Teaching Students Leaders?

Higher education has been a place to develop the next generation of leaders. Within the last 30 years, leadership development has become an explicit educational outcome of colleges and universities (Association of American Colleges and Universities, 2007; Dugan & Komives, 2007). As a result, there are over 1,000 formal student leadership programs on college campuses across the United States (Brungardt, Greenleaf, Brungardt, & Arensdorf, 2006). Despite all these student leadership programs, many claim there is a leadership crisis in the United States. Turbulent race relations, government gridlock, widening political and socioeconomic divide, and rampant cover-up of workplace sexual harassment, all point to this crisis (Astin & Astin, 2000). Many call for better training and development of student leaders to develop the competencies to handle the rapidly changing global world when they leave college. However, the vast majority of student leadership books, programs, curricula, theories, and models fail to account for how leaders perpetuate the same system that benefits the privileged and dominant group (Pendakur & Furr, 2016). This analysis examined the content of student leadership programs. If colleges and universities want to produce leaders who can address the challenges as it relates to diversity, equity and inclusion, a content analysis of course syllabi is an essential component to understand what is being taught in these courses.

AGEP Student Success Conference
Michigan State University, East Lansing, Michigan
November 23, 2019

Celeste Smith
Oakland University

*Understanding the Experiences of Black Women in Obtaining Marital Partners
while Pursuing Advanced Degrees*

This research will seek to understand the experiences of Black Women in obtaining marital partners while pursuing advanced degrees. The current research establishes that level of education impacts marital status for all women, but especially black women. However, the research fails to acknowledge the "why" This will be an overview of a qualitative, phenomenological dissertation study, which will be conducted with six to 15 participants.

Student Oral Presentation Abstracts

Room 105 AB

Rajab Curtis
Michigan State University

Screening and Identification of Novel Plant-Inspired Anti-Microbial and Anti-Cancer Agents

The bacteria Enterobacter cloacae and Staphylococcus aureus pose major threats to human health. According to the Centers for Disease Control both pathogens are among the biggest antibiotic resistant threats facing the United States of America, naming carbapenem resistant Enterobacteriaceae (CRE) as urgent threats and methicillin resistant Staphylococcus aureus (MRSA) as serious threats. Enterobacteriaceae are highly opportunistic and cause significant morbidity and mortality in hospital settings particularly among patients with compromised immune systems. Complicating this is their high rate of antimicrobial resistance: currently we have very few compounds that can effectively inhibit these bacteria, and complete resistance has been reported in some strains. The Staphylococcus genus is the most common cause of skin and soft tissue infections. This is especially problematic when the infecting strain is resistant to methicillin as the cassette for methicillin resistance often carries resistance to other widespread and effective antibiotics. Even more troublesome are small colony variants (SCV), isolated from persistent infections. These variants are physiologically altered and more difficult to treat than the wild type strains because of their altered growth characteristics. My work aims to identify novel pharmaceutical compounds that can be used to inhibit the growth of or kill these two problematic bacteria. We collaborate with groups in Pharmacology/Toxicology and Plant Sciences to develop novel chemical matter as well as more traditional compounds to screen in my research. Preliminary screens of small molecule chemical libraries have identified potentially promising leads against especially MRSA and MRSA/SCV, and these are being studied further.

Ayman Abdullah-Smoot
Texas Southern University

Mass Measurements of 27P for Improved X-ray Burst Simulations

X-ray bursts are astronomical explosions that occur when a neutron star takes hydrogen and helium particles from its companion star in a process called accretion. These accreted particles build up on the surface of the neutron star leading to thermonuclear runaway, resulting in an X-ray burst which creates heavier elements via the rapid proton capture process (rp-process). The rp-process occurs when nuclear reactions cause stable nuclides to gain protons and beta decay which forms new elements. The path of the rp-process, the order in which reactions occur, can be studied by examining light curves of individual X-ray bursts. Light curves measure an X-ray burst's luminosity over its duration. By creating an accurate light curve simulation and comparing it to the actual light curve, X-ray bursts can be studied; furthering knowledge on the elements that are created during a burst. In order to create accurate simulations, the mass of all elements involved in the rp-process must first be known and their mass uncertainties must be small enough so that there is a negligible effect on the light curve simulation. For the extremely short-lived phosphorus-27 (27P), the measured mass is not very precise and thus has too large of an uncertainty creating a significant knowledge gap in the plotting of the light curve simulation. It is also important to know the mass of 27P in order to determine the rate of the 26Si(p,γ)27P—27P(γ, p)26Si reaction, an important reaction in determining the path of the rp-process. Since silicon 26's

(26Si) mass is already known we believe that we can find a mass measurement of 27P with a small enough uncertainty, allowing us to determine the rate of the 26Si—27P reaction and create an accurate light curve simulation. We measured this mass using a continuous beam of 27P and a Penning trap mass spectrometer. By scanning across multiple frequencies that were inputted into the spectrometer we found the frequency that yielded the fastest time of flight of 27P particles and used it to calculate 27P's mass. From our calculations, we found a mass measurement that was 40 times more precise than the previously recorded mass measurement and discovered a much smaller mass uncertainty. We also found the mass to be heavier than previously measured. Given that our finding is heavier we predict a slower rate for the 26Si(p,γ)27P reaction meaning the reverse reaction, 27P(γ, p)26Si, is more likely to occur. And given that we found a smaller mass uncertainty, a light curve simulation can be more accurately created. Using this simulation, people studying X-ray bursts can better examine the order in which elements are created by these astronomical phenomena.

Sonia Morales

Northeastern Illinois University

Evaluation of Urban Spatial Composition as a Consequence of Rapid Urbanization
of Latin-American Cities Fringe

The urbanization trends in the last decades shifted from an industrial local pattern to the constitution of megacities around the globe. In Latin-America the traditional 'peripherisation' associated with an uncontrolled process of urban expansion and illegal settlements is transforming into a more complex structure. This complex structure responds to new and different economic dynamics occurring in the periphery of cities, and it is driving the creation of megacities in Latin countries. The aim of this research is two-fold: 1) Pinpoint the three megacities with the highest urban expansion from 2000 to 2015 in Latin America; and 2) explore the consequences of high urbanization in these three Megacities. The research will evaluate the fringe between cities and how the change in the infrastructure and emplacement of new high and middle-class residential areas is affecting preexisting illegal settlements in Latin-America. I'm proposing to use remote sensing techniques and local census information to identify the land use composition in the fringe of these three cities. I will compare the landscape metrics in the expansion area of cities using Fragstats, and Implement a quantitative spatial statistics to identify any kind of spatial segregation or changes over time. I will use local shapefiles of risk areas and other environmental features to determine who is more exposed to hazardous zones. In addition, I will evaluate the location of road network shapefiles to identify which population has more access to roads to determine the environmental and connectivity consequences of rapid urbanization in the Latin-America.

Jennifer Watts

Michigan State University

The Effects of Sexually Transmitted Zika Virus Infection on Preimplantation Development

Adults contracting Zika virus (ZIKV) exhibit mild cold-like symptoms, whereas fetuses exhibit defects ranging from mild growth retardation to miscarriage. Aside from transmission via mosquito, ZIKV is to also sexually transmitted, which introduces the possibility that ZIKV infection could occur shortly after conception. However, the mechanisms underlying ZIKV-induced birth defects in early development are not understood. I hypothesize that sexually transmitted ZIKA virus infects embryos around the time of conception, leading to the most severe congenital defects. Consistent with this hypothesis, I have discovered that candidate ZIKV receptors are present in early embryos. Among these, the MERTK is present in mouse embryo-derived stem cell lines, extraembryonic endoderm (XEN) cells and preimplantation development. However, our results show that ZIKV does not highly infect embryonic stem cells and preimplantation embryos as predicted. Therefore, ZIKV infection that occurs during fertilization and post-implantation would cause

severe birth defects. To further my studies, I will identify essential viral entry components of ZIKV endocytosis using molecular and pharmacological tools. The results generated will reveal the mechanism of ZIKV infection in embryo-derived stem cells and embryos. My studies are significant to human health because they will further our knowledge of ZIKV infection in early pregnancy and outcomes for newborn children. This work is supported by NIH T32 HD087166 awarded to J.W. and the James K. Billman, Jr., M.D. Endowment awarded to A.R.

Yatesha Robinson
Western Michigan University

Positive Messages and Wellbeing in African American Women

The purpose of this exploratory study was to investigate if intentional exposure to affirming messages via podcast technology would lead to improvement in overall wellbeing in African American women. Positive affirmations have a long history of being used to improve subconscious thoughts, feelings and beliefs. An intervention using positive messages may benefit African American women as they routinely experience conditions such as discrimination, poverty, increased responsibilities, safety issues, and community stressors that contribute to high stress within African American communities. These factors have been linked to psychological distress that can compromise wellbeing in African American women. This study used a mixed-methods design to measure subjective wellbeing using the Multicultural Quality of Life Index (MQLI) and a series of focus groups. The benefits of the podcast experience were affirmed by the results from the MQLI and data from the focus groups. These findings suggested that intentional exposure to positive messages may help African American women cope with life stressors.

Vanessa Garcia Polanco
Michigan State University

Equity and Inclusion in Urban Agriculture

In the US, Midwest cities like the Greater Lansing area have experienced significant population declines and increased poverty as a result of deindustrialization. While much of the region continues to struggle economically, some cities have experienced population increases and downtown revitalization as a result of new immigrant and refugee settlement and urban agriculture initiatives like community gardens. There is little literature on deindustrialized Midwest urban areas with high cultural diversity in community gardens. However, areas on the West and East coasts have shown that refugee and immigrant food projects in urban areas contribute both to crop and plant diversity, as well as cultural diversity through community building and social learning. The process of bio-cultural mapping is a mixed methods community-based research approach to documenting both biological and cultural diversity of a particular landscape. The proposed project will use the methodology of bio-cultural mapping to document how refugee and immigrant gardeners in the Greater Lansing area use and interact in community garden spaces in the urban landscape. Urban Landscapes decidedly constitute varied environments (from parks to gardens) with plant biodiversity and present culturally diverse peoples with social challenges. Many times, immigrants and refugees remain marginal in conversations about urban agriculture. By highlighting the voices of immigrant and refugee urban gardens, this research hopes to make the case for more inclusive and equity-driven urban agriculture initiatives.

AGEP Student Success Conference
Michigan State University, East Lansing, Michigan
November 23, 2019

Joelyn de Lima
Michigan State University

The Evolution of an Agriculture-Ecology Outdoor Activity Trail: Community Partnership in Action

Community engaged teaching and learning occurs when members of a community leverage existing or form new relationships to create an outcome that is favorable to all. They come together and work to increase their knowledge about the topic and to construct new knowledge. My community engaged teaching and learning project focusses on the development of an activity trail at Michigan State University's W. K. Kellogg Biological Station (KBS). This activity trail was based on the research from the KBS Long-term Ecological Research (LTER) Program and was designed to introduce elementary students to both agriculture and ecology, and be a resource for outdoor informal education. The development of the activity trail was an iterative process that included multiple people (both community and university partners) and drew from multiple domains of scholarship. While designing and implementing this project we used the theoretical frameworks and guidelines that come with informal learning, environmental education, outdoor education and place-based learning. We also used theoretical frameworks and guidelines from informal learning and practice-based-evidence to evaluate the various phases of this project.

Marcus Bunn
Michigan State University

Emerging Role of C-peptide on Neutrophils

Neutrophils are the most abundant immune cell in the body and are the first responders to infections. Important neutrophil functions include chemotaxis, migration and bactericidal function. However, in individuals with diabetes, these key functions do not occur properly. Individuals with diabetes are not only at a higher risk for infection, but the severity of the infections is also increased. It is hypothesized that neutrophils in a diabetic environment cannot uptake glucose properly leaving them in an energy-deficient state. C-peptide is a 31-chain amino acid peptide produced in the pancreatic beta cells. Previous work performed in the Spence lab has shown that interactions with C-peptide increases glucose absorption into, and ATP release from, red blood cells (RBCs). However, we have also shown that for C-peptide to interact specifically with RBCs to elicit a biological response, both $Zn2+$ and albumin are necessary. Preliminary work has been performed showing that C-peptide also binds to neutrophils in a specific manner. Here, we show C-peptide interactions with neutrophils in the presence or absence of both albumin and $Zn2+$. Neutrophils were collected from whole blood samples from consenting adults and separated from other cell types by immunomagnetic separation. Neutrophils were incubated with varying combinations of C-peptide, $Zn2+$, and albumin. C-peptide binding was determined using enzyme-linked immunosorbent assay (ELISA). $Zn2+$ binding was determined radiometrically using 65 $Zn2+$, and radiation was counted using a gamma counter. Our results preliminarily suggest that both albumin is required for delivery of C-peptide, but not $Zn2+$. However, there appears to be additional $Zn2+$ added to the neutrophils when in the presence of both the albumin and C-peptide system, suggesting a specific binding site for both on the neutrophil.

Rahul Jain
Michigan State University

Nuclear Mass Model with Machine Learning Algorithms

Knowing the mass of a nucleus is very important to predict whether a particular nuclear reaction can proceed or is forbidden energetically. As a result, nuclear masses play a crucial role in designing nuclear reactors, nuclear weapons, medicinal radioisotopes production facilities, etc. They also help us understand the inner working of stars, explosive stellar events like supernovae, the origin of elements and much more. However, we cannot yet quite measure or predict the masses for a lot of nuclei. Around 7000 nuclei are estimated to exist in nature, some stable, some unstable. Of these, only around 3000 have even been produced and studied by us. The masses for all others are predicted theoretically using several different models that are inconsistent with each other. In such a scenario, it is extremely important to have a data-driven global mass model that can predict masses for these nuclei along with empirical confidence intervals. I will present our efforts and some preliminary results for developing such models using the Gaussian Process Regression - a popular machine learning algorithm

Student Poster Presentation Abstracts
Big Ten A

Amber Lynn Garrison
Michigan State University

Chronic Morphine-Induced Changes in Gene Expression in the Ventral Tegmental Area (VTA)

Opiate abuse is a growing epidemic in the US and has led to a large increase in overdose deaths. Despite the significant risk for abuse that opiates possess, relatively little is known about the neuroadaptations that occur with chronic use. Most studies to date have focused on opiate-induced changes in mesocorticolimbic reward circuit function. For example, chronic administration of opiates, such as morphine, is known to alter activity and morphology of dopamine (DA) neurons within the ventral tegmental area (VTA). Our lab is interested in identifying the molecular mechanisms.

Amiracle Williams-Anderson
Roosevelt University

Risk Behavior Stigma and Substance Abuse in Latino MSM

BACKGROUND: Risky behaviors are behaviors in which an individual consciously or unconsciously does something that puts them in harm's way. This includes unsafe sex practices and substance abuse. There is an increased need to reduce stigma related to sexual behaviors and substance abuse in gay men and other men who have sex with men (MSM). However, most studies do not consider how race and the culture that comes with one's race affects the stigma as well. OBJECTIVE: The objective of these analyses is to determine the association between perceived stigma and alcohol use as well as perceived stigma and meth use. Also, to determine to what extent does social support effects of experienced and perceived stigma, meth use and alcohol use. METHODS: A 479 item questionnaire was given to 643 Latino MSM in Chicago by the Inter-University Consortium for Political and Social Research (ICPSR) in 2004. With this data, I will conduct secondary analyses using multiple logistic regression and mediation. STATA, a statistical software program will be used to conduct these analyses."

Anneliese Samples
North Carolina Central University

Owning my sexuality: Assessing the Relationship Between Sexual attitudes, Sexual Exploration and Erotophobia among African American College Students

The topic of sex and sexual exploration for African Americans has been a topic of debate and consternation for years. Given the negative narrative and stereotypes (i.e. hyper sexuality, promiscuity and lasciviousness,) associated with sex and sexuality (Brown, White-Johnson & Griffin-Fennell, 2013) as it relates to young African Americans there is a need to understand how the negative narrative has impacted sexual attitudes and behaviors among African Americans college students. To assess the relationship between sexual attitudes, sexual exploration and erotophobia, a sample of 200 African American College Students from a Historically Black College and University in the mid-Atlantic will be solicited.

Pearson correlations will be run to examine the relationship between sexual attitudes, sexual exploration, erotophobia and perceived parental attitudes. To assess differences in erotophobia across type of sex education received in high school and whether or not they have received sexual education courses in college independent sample T-tests will be run. Given the increase in STIs among college aged populations (CDC, 2015) and relationship challenges among African Americans during this period of sexual identity and sexual exploration, there is a need for health and human service and mental health professionals to better understand sexual identity and sexual expression among African Americans.

Areej Askar
Roosevelt University

Pterostilbene Treatment Results in Differential Gene Expression in Trabecular Meshwork Cells

Our overall goal is to determine the possible role pterostilbene in anti-oxidant pathways in glaucoma pathology through the examination of these factors in trabecular meshwork (TM) cells. The TM, a tissue essential in the outflow of aqueous humor from the anterior portion of the eye, is considered to play an important role in maintaining intraocular pressure, a known risk factor for glaucoma. In this study, we used human TM cell cultures to investigate the differential expression anti-oxidant genes after chronic treatment with pterostilbene. TM cells were either treated with DMSO vehicle or 70 uM pterostilbene for 14 days. In addition, TM cultures were treated with H_2O_2 to induce oxidative stress as previous studies have suggested that oxidative damage may be an important step in the pathogenesis of primary open-angle glaucoma. TM cell cultures were treated with 200 uM H_2O_2 or with 200 uM H_2O_2 and 70 uM of pterostilbene for 14 days. Total RNA was isolated and cDNA was prepared by reverse transcriptase PCR. Expression of differentially expressed genes in these samples was determined through real-time PCR analysis using gene specific primers and SYBR Green. Analysis of anti-oxidant genes using these samples suggest that an alteration in expression patterns in response to oxidative stress in TM cells may be partially reversed if treated concurrently with pterostilbene. Future experiments will focus on the further elucidation of the role of pterostilbene treatment on gene expression in TM cells and its possible use to reverse the effects seen in glaucoma pathology.

B. Malique Jones
Michigan State University

Histamine may Directly Contract Urinary Bladder Smooth Muscle

Mast cell degranulation and histamine release contribute to painful bladder syndrome, urinary tract infections, interstitial cystitis and other bladder disorders. The effects of histamine are well-studied in other tissues, but little is known about the role of histamine and histamine receptors within the bladder. Since other smooth muscle cells express H1 (contractile) and H2 (relaxant) histamine receptors, we tested the hypothesis that histamine causes contraction of urinary bladder smooth muscle in mice. Six to 12-week-old C57Bl/6 mice were euthanized and dissected bladders were cut into approximately 2 mm wide bladder strips, with or without the urothelium attached, for isometric contractility experiments. Both histamine H1 and H2 receptors were expressed in bladder smooth muscle cells. Increasing concentrations of histamine (100 nM – 200 µM) did not contract strips without urothelium and minimally contracted bladder strips with urothelium. However, bolus administration of 200 µM histamine caused a rapid and transient contraction in strips with and without urothelium. The H1 receptor blocker fexofenadine (5 - 10 µM) blocked these contractions ($P<0.05$; N=5), whereas the H2 receptor blocker cimetidine (5 - 10 µM) had no effect. These results indicate

that H1 receptors modulate histamine-induced bladder contraction, but further investigation is needed to determine if this is due to direct actions on smooth muscle histamine receptors and not histamine receptors located on sensory nerves.

Breanna Lawrence
Michigan State University

Estimated Exposure of PFAS in Dental Floss

Per and polyfluoroalkyl substances (PFAS) are a group of synthetic chemicals that include perfluorooctanoic acid (PFOA), which are used in many products for their stain and water-resistant properties. PFOA was phased out of use in 2015 due to health concerns and replaced in products with other PFAS chemicals. One surprising product that uses PFAS is dental floss. A 2009 study by the Food and Drug Administration (FDA) reported PFOA in a new type of unwaxed gliding dental floss. Human exposure was thought to be low from this use, as previous studies suggested PFOA has low dermal absorption. However, a recent study reported that women who reported using that same type of dental floss (i.e., Glide®) had higher levels of PFOA in their blood compared to women who used other types of floss. This suggests that absorption of PFAS from dental floss may be higher than previously thought, possibly due to increased absorption through the gums compared to skin. Therefore, we aim to estimate total exposure to PFAS in dental floss from contact with the gums and the mouth.

Brenden Wimbish
James Madison University

Colloidal and Antibacterial Studies of Polymers of Triple-headed Mesitylene-based Cationic Amphiphiles

A significant challenge facing the medical field is the proliferation of bacteria that are resistant to modern antibiotics (e.g., Methicillin-resistant Staphylococcus aureus, or MRSA). New antibacterial compounds are therefore important targets for medical applications, and industrial and agricultural cleaning procedures. We have synthesized three new amphiphilic cationic polymers, referred to as (M-12)12, (M-18)12, and (M-22)12, which all possess the potential for antibacterial activity. Each of these novel polymers has a repeat unit consisting of a mesitylene core, three quaternary ammonium groups, an alkyl chain tail, and a dodecyl linker ($C_{12}H_{24}$). Nuclear Magnetic Resonance (NMR) and Atomic Force Microscopy (AFM) were utilized to investigate the structure and morphology of these cationic polymers. AFM experiments suggest that (M-12)12 is capable of forming both micelles and vesicles in water. Ongoing work includes the preparation of additional derivatives, as well as biological and colloidal examination of these polymers.

Brianna Ross
North Carolina Central University

Rewriting the Black Woman's Story: An Examination of Activism among Black Women in America

Black women in America have consistently been at the forefront of almost every civil, political, and cultural activist movement. As of 2017, Black women have created movements such as Black Lives Matter, the Black Youth Project 100, the Black Alliance for Just Immigration, Say Her Name, and Black Girls Vote (Altman, 2015; Guzman, 2017; Mitchell, 2017). The purpose of the present study was to identify what factors were related to and increased activism among

Black women. To do this, 200 Black women from a mid-sized, Mid-Atlantic city were sampled. Pearson correlations and standard and hierarchical regression tests were used to assess associations between activism, spirituality, psychological empowerment, and perceived racism. The results indicated significantly positive relationships between activism, psychological empowerment and perceived racism; such that, psychological empowerment and perceived racism both significantly predicted activism. Contrary to expectations, spirituality and activism were not related in the present study, which suggests a need to update the definitions of these two variables. These results have implications for future researchers, mental health professionals, and community/government representatives.

Bridget Pittman-Blackwell

North Carolina Central University

The Relationship Between Grade Point Average, Body Image, and Self-Esteem
Among African American College Women

Much of the research on body image has been conducted on European American women while few studies have investigated the influence of the thin ideal among African American women. Past research has suggested that African American women's perceptions of the ideal body type differ from that of European American women. With changing times there has been a suggested shift in perception of the ideal body type, especially among young African American women may suggest a shift in perceptions of the ideal body type. The purpose of the original study was to assess the relationship between racial socialization, racial identity, acculturative stress, body image, and self-esteem among African American college women. A secondary data analysis was ran on the relationship between grade point average, body image, and self-esteem. One hundred and forty-nine African American college females participated in the current study. To understand the relationship between the variables, Pearson correlations were run.

Charles Green

Pennsylvania State University

Machine Learning Approaches to Predict Learning Outcomes in Online Courses

Improving the learning experience can be done with the use of Learning Analytics. Based on the Open University Learning Analytics dataset, in 2013 and 2014, 47.25% of the people in the selected modules passed while 21.62% failed and 31.13% drop the class. This could be for a multitude of reasons age, gender, location or activity on the online course. Finding which one of the many influences on their grades are the most impactful on the final outcome of the class can help raise the number of people passing and passing with distinction, while also lowering the drop and fail rate of classes. The goal was to test different machine learning algorithms and to compare their performances for this dataset. We also used the data obtained from machine learning to help find which influences are most important in predicting the final outcome of a class. Demographics from 32,593 students, their assessment results and the logs of their interactions on the online courses will be used to test machine learning algorithms such as Decision Trees and Support Vector Machines, amongst other Machine Learning Algorithms. With the analysis of the test, a strong correlation between 3 features and the final outcome of a course was found, the top feature being Percentage of Assessments Taken. With the algorithms tested, Gradient Boosted Decision Trees and Random Forest achieved the highest accuracy with Naive Bayes having the highest efficiency. Conversely, Support Vector Machines achieved the worst in both of these categories.

Daryl Jones

Jackson State University

Gauging the Varying Levels of Engagement for Virtual Environments as it Pertains to Fidelity

Virtual Reality is defined as an artificial experience that stimulates the brain by manipulating sensory information. The expansion of virtual reality has been encouraged by competitive gaming. However in recent years, studies have shown that the use of Virtual Reality has proven to be a useful technique for educational purposes (Granville 2014). Contrary to popular belief, Virtual Reality is not a new concept. Research of virtual reality reaches back the the early eighteen hundreds. However, in its extensive history this technology has struggled to become a useful tool in academia or entertainment. This is mostly due to technological limitations. The rapid growth and expansion of technology in the past two decades have began to challenge these limitation. Modern day virtual reality tools often use high quality game engines in order to create sensory stimulation. A game engine is a software framework that developers use to combine graphics, physics, and audio in order to create video games. Engines provide these toolsets and content pipelines in a convenient way across a variety of commonly used formats. These tools allow the developer to quickly combine situational game experiences without having to recreate a lot of tedious conventional structures. This study seeks to find a correlation between the quality of virtual reality environments and user engagement. This was done by creating a highly detailed, tropical environment using various software applications such as CrazyBump, Open Street Maps, Blender, and the Epic Games marketplace. The assets created in by these programs were integrated into Unreal Engine 4, which is a commonly used gaming engine. This trial displayed the different levels of difficulties while combing assets in order to achieve higher levels of immersion. In contrast, a less detailed version of the virtual environment was also created. Test subjects were then immersed both of the virtual environments. While in this virtual space, the subjects were given information about the Belizean ecosystem, wildlife, and water-system. The subjects were then surveyed in order to gain qualifying information about the correlation between the importance of fidelity in virtual reality and user engagement.

Elizabeth Ampong

Northeastern Illinois University

Impact of Exchange Rate Volatility on Foreign Direct Investment and Portfolio Investment

Exchange rate volatility impacts investment inflow to a country in many different ways, as high volatility increases investor uncertainty. This paper seeks to explore the magnitude of impact that exchange rate volatility has on Foreign Direct Investment (FDI) inflow to selected African countries. What this paper will do different from past research is that an additional investment category, Portfolio Investment (which behaves differently from FDI), will be included in the analysis to compare the impact of exchange rate volatility on portfolio investment to that of FDI. Additionally, the number of macroeconomic variables to be included in the research will be more extensive compared to prior studies to make room for greater accuracy. Using Panel Data Analysis, with 10-year period data, we will run a regression on exchange rate volatility and FDI, as well as exchange rate volatility and Portfolio investment. We aim to ascertain if there is a correlation between the impact of exchange rate volatility on these two kinds of investments and to what extent.

AGEP Student Success Conference
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Emily Egan

Siena Heights University

Personality Traits and Delinquent Behavior Among Delinquent and College Females

Involvement in delinquent behavior for juveniles and young adults has always been an issue. It is possible that there is a presence of certain personality traits in those involved in this type of behavior than those who are not involved. If there are certain traits that are predictive, then the identification of these traits early on in at-risk youth could help create preventive measures for the at-risk youth with said traits. Participants for this study were only female and came from a detention center and college. The instruments utilized in this study were the NEO-PI-3 and DBVS. The hypotheses for this study was that females considered delinquent would score higher on certain facets of Neuroticism and lower on certain facets of Agreeableness and Conscientiousness. As hypothesized, analyses found significant differences for the traits Neuroticism and Conscientiousness, but not for Agreeableness. Additional analyses of the facets identified expected results for Neuroticism/Impulsiveness and Conscientiousness/Deliberation. Multiple regression models also found Impulsiveness as the most reliable predictor variable. The results provide mixed but interesting support for predicting delinquency in female subjects using the Big Five.

Gerald Tran

Western Michigan University

Formation and Measurement of Lipid Vesicles by Multi-Angle Light Scattering

Cardiovascular disease (CVD) is the leading cause of death in the world. According to the World Health Organization, CVD was responsible for 17.9 million deaths, 31% of all global deaths in 2016. Furthermore, coronary heart disease (CHD) accounts for 43.2% of all CVD related deaths in the United States alone. In the past research in the fields of biology, medicine, and engineering has been focused on better understanding the role of lipoproteins in the causation of heart diseases such as atherosclerosis. It is hypothesized that there is a correlation between a patient's risk of heart disease to the number and size of LDL particles, specifically small dense LDL (sdLDL). As a result, there is need for a better technique for size determination of LDL particles. A proposed method is multi-angle light scattering (MALS) for its accuracy, potential ease of use in the medical field, and cost effectiveness. In our study, we will be forming our own lipid by a specialized extrusion method. These lipid vesicles will then be measured using multi-angle light scattering, and a particle size will then be calculated. In the future we will also optimize separation techniques using size exclusion chromatography and/or field flow fractionation. In these studies, we will attempt to optimize light scattering measuring procedures that will be eventually used, in conjunction with separation techniques, to accurately measure LDL size distributions for use in heart disease diagnosis. Additionally, these studies will assist in examining the role of LDL size in atherosclerotic disease. Furthermore, in the future, we hope to examine how these lipid vesicles may also be used as a means for targeted drug delivery.

Jacob Jenkins

Siena Heights University

Code-Switching for Success: The Use of African American Vernacular English on College Campuses

If you've ever heard the phrase, "Ain't nobody got time for that" then you have heard someone speaking African American Vernacular English (AAVE). AAVE, which has also been referred to as Ebonics or Black English, has existed for generations and has had a significant impact within African American communities, usually being adopted as the official and preferred language among speakers. However, when college age AAVE speakers attend predominantly white institutions (PWI), other meanings and perceptions accompany the language. These meanings are connected to the centuries of negative perceptions of African Americans as uneducated, loud, belligerent, and even less than human. To combat these perceptions, African American students use code-switching in the workplace and on college campuses while talking to professors and professionals in order to alleviate the associations and labels of ignorant and "ghetto." These stereotypes and misconceptions of black people, as well as the expectation to code-switch and conform to other language patters, has left the burden of communication to the African American students. This project explores the historical context of AAVE, perceptions of those who speak it, as well as the implications when speakers of AAVE are expected to code-switch in order to be taken seriously and become successful. Should it be up to the black students to conform to something that they are not in order to accommodate those who do not understand where they come from, or should others learn how to accept the dialect as a valuable representation of the culture they come from?

Jalin Jordan

Michigan State University

The Effect of Relaxed Selection on the Fitness Costs of Resistance Mutations

Bacteria often evolve spontaneous mutations or acquire genes that confer resistance to antibiotics; a phenomenon known as antibiotic resistance. However, these mutations often carry a fitness cost. This cost occurs because resistance mechanisms either increase the energetic burden on the cell or disrupt the normal functioning of metabolic pathways and physiological processes. One would therefore expect that sensitive cells would outcompete their resistant counterparts in the absence of antibiotics. Despite this expectation, it is not well understood how prior evolution in an environment without stressors, including antibiotic drugs, affects the fitness costs of resistance mutations that evolve under subsequent drug selection. We address this question using Escherichia coli strains from the long-term evolution experiment (LTEE) that independently evolved under relaxed selection for multiple decades in a permissive environment. We focus our study on quantifying the fitness costs of resistant mutations to the drugs ampicillin and tetracycline by competing cells harboring these mutations with their sensitive progenitors. We predict that the fitness costs of resistance mutations will depend upon their genetic context and thus correlate with a history of relaxed selection in the LTEE. The results from our study may have a number of implications for the public health sector. For example, our work may improve our understanding of the evolutionary processes underlying resistance evolution and its prediction.

James Mostek

Western Michigan University

Geosynchronous Servicer Mission Planning and Design

Mission design of a robotic servicing satellite in geosynchronous Earth orbit was studied. The servicing satellite was assumed to be capable of performing several operations, including refueling, repair, re-positioning, observation and retirement, which aim to improve life expectancy of the client satellites and contribute to a safer environment within the geosynchronous belt. Through a database of representative client satellites, a rendezvous sequence was investigated to devise an efficient path to maximize mission value. A genetic algorithm was used to produce these sequences and data on the servicing satellite was studied. Impulsive maneuvers and continuous-thrust maneuvers were compared and allowed further investigation of the propulsion system that would best match the mission purpose. Further exploration of a more efficient path was studied by comparing the client satellites' projected angular momentum vectors in the sequence that the genetic algorithm produced. Detailing the mission design with this information enabled us to identify the highest-value rendezvous sequence and develop recommendations for future multi-client satellite servicing mission design.

Jen Fry

Michigan State University

How has Conference Realignment Affected the Numbers of Black Volleyball Players?

Conference realignment has been of big concern within the NCAA Division I landscape as more teams are moving away from conferences that are in close proximity to their institutions, to conferences spread throughout the country for reasons such as revenue sharing, moving into a football bowl series (FBS) conference, the ability to play teams in areas much of their student body comes from, or name recognition. Between the years of 2011 and 2018, 12 schools moved into or within the Power Five Conferences which are considered to be the top conferences in the nation. These conferences are the Pacific-12 Conference (PAC-12), the Atlantic Coast Conference (ACC), the Southeastern Conference (SEC), the BIG TEN Conference, and the BIG 12 Conference. This movement has not potentially only changed the geographical demographics of who teams recruit, but also the racial demographics of the team. Disaggregating the data on Division I Volleyball Teams will allow us to find out if the conference realignment assisted institutions who moved conferences, with having more Black volleyball players as self-reported by the institution.

Jessie Pink

DePaul University

The Effectiveness of Local and National Media Coverage on Gentrification in Detroit Through Emotional Responses of African American Residents

The purpose of this research study is twofold. It determines the effectiveness of local and national media coverage on gentrification in predominantly African American communities in Detroit, Michigan. This study also examines the emotional responses of residents in predominantly African American communities in Detroit when discussing the effectiveness of local and national media coverage on the socioenvironmental issue. In short, the results generated from this study supported desired results. With "Frustrated," "Unhappy," and "Annoyed" being the predominant emotional responses, this study confirms that there are overall negative emotional responses of Detroit residents in predominantly African American communities when discussing the effectiveness of local and national media coverage on environmental racism. Such responses supported another concept from this study, which is that there is ineffective local and national media coverage on environmental racism in predominantly African American communities in Detroit.

John Tran

Michigan State University

Using Genetic Engineering to Redesign Plants for Biofuel

Lignin is a complex polymer deposited in the plant secondary cell wall. The aromatic polymer is key to forming structural materials that support the growth and development of vascular plants. Genetic approaches to perturb lignin in Arabidopsis have led to the modification of lignin composition, which are comprised of mainly three monolignol subunits: p-coumaryl alcohol, sinapyl alcohol, and coniferyl alcohol. While perturbations have provided insight into the biosynthetic pathway of lignin and strategies for redesigning it in plants to improve biofuel technologies, a critical step during its synthesis is not well understood. An understanding of how the building blocks of lignin are moved out of the cell from the cytoplasm to the apoplastic space where polymerization occurs has potential to advance biofuel technologies. I have data that suggest a transporter protein plays a role in this step. Findings from my research could provide insights to regulate the amount of lignin in biofuel crops. I will discuss efforts using gene expression data and T-DNA knockout lines to identify this protein and other genetic approaches to support its role in lignin translocation.

John Vasquez

Michigan State University

After the Ph.D.: The Role of Advisement & Mentorship in Postdoc Career Decision Making

The postdoctorate is one of the most common positions recent PhD graduates move into after graduation (Cantwell & Lee, 2010; Cantwell & Taylor, 2015). In 2014, there were an estimated 79,000 postdocs at colleges and universities in the U.S. and has steadily increased due to the postdoctorate becoming a de facto next career step following completion of a doctoral degree (NPA, 2014). Postdocs take these positions in order to increase their chance of getting a faculty position (McConnell, et al., 2018; Sauermann & Roach, 2016), however, the number of postdoc researchers has increased over 150% over the past decade, far surpassing both the percentage increases in graduate students and tenure-track faculty positions available (NAS, 2014). Research now suggests postdoctoral employment no longer guarantees a faculty position, but rather becomes a holding bay for other future employment (Nerad & Cerny, 1999; Stephan, 2013; Zumeta, 1985) and allows postdocs to "buy more time for career exploration" (Fuhrmann, 2016, pg. 871). This change in the role and need to take a postdoctoral position requires a need for a more nuanced understanding of postdocs career development. This study utilizes a narrative methodological approach to illuminate the department, institutional, disciplinary, and familial attributes that postdocs identify as hindering and/or supporting their chosen career trajectories, especially in the biological sciences. Findings from this study can be used to develop and enhance mentoring and career preparation programs to help doctoral recipients prepare for a variety of career pathways.

José Vargas-Muñiz

University of North Carolina-Chapel Hill

Fishing for Fungi: Marine-derived Fungi Provide New Models of Cell Division

Fungi have been found in every marine habitat that has been explored, however, the diversity and functions of fungi in the ocean are poorly understood. In this study, fungi were cultured from the marine environment in the vicinity of Woods Hole, MA, USA including from plankton, sponge and coral. Our sampling resulted in 36 unique species across 20 genera. We observed many isolates by time-lapse, differential interference contrast (DIC) microscopy and analyzed modes of growth and division. Several black yeasts displayed highly unconventional cell division cycles compared to those of traditional model yeast systems. Black yeasts have been found in habitats inhospitable to other life and are known for halotolerance, virulence, and stress-resistance. We find that this group of yeasts also shows remarkable plasticity in terms of cell size control, modes of cell division, and cell polarity. Unexpected behaviors include division through a combination of fission and budding, production of multiple simultaneous buds, and cell division by sequential orthogonal septations. These marine-derived yeasts reveal alternative mechanisms for cell division cycles that seem likely to expand the repertoire of rules established from classic model system yeasts.

Kalani Gates

Western Michigan University

Barriers to Engaging in a Computerized Cognitive Behavioral Therapy in an Obstetric Clinic for Depressed Low SES Mother

Pregnancy and the months following childbirth are periods when women are at an increased risk for depressive symptoms. A large body of literature exists on the deleterious and lifelong consequences that prenatal and postpartum depression can have for mothers and their children. Mothers from low socioeconomic (SES) backgrounds are at an even greater risk of experiencing depressive symptoms, relative to mothers from middle- and upper-class backgrounds. In addition to higher prevalence rates for depression, low SES individuals often face barriers which may forestall or completely avert access to mental health services. More recently, computerized cognitive behavioral therapy (CCBT) programs have been developed with an aim to expand the access of evidence-based mental health treatments. However, accessing the technology necessitated by CCBT programs may not always be feasible for low SES individuals due to financial constraints (e.g., individuals from this group may not have access to a computer or the internet in their homes). One way that researchers have addressed this constraint is through the implementation of CCBT interventions in integrated behavioral health (IBH) settings. Even with this additional measure in place, low SES women with maternal depression still face supplemental access-related barriers. The current study sought to add to the understanding of treatment barriers that financially disadvantaged mothers face when receiving a CCBT intervention for depression in a primary care setting. Results from this study identify relevant treatment barriers and provide recommendations to mitigate poor treatment adherence.

Keywords: Maternal Depression; Prenatal Depression; Postpartum Depression; Mental Health Service Engagement; Computerized Cognitive Behavioral Therapy; CCBT; BAML

Kristen Trinh

University of Arkansas

Detection of Waterborne Pathogens in Water Using Magnetic Nanoparticles

Bodies of water as large as lakes and rivers can easily get contaminated with pathogenic bacteria due to pollution, animals, or humans. Common pathogenic bacteria like Escherichia coli, Vibrio species, and Salmonella species can potentially make these areas unsafe for humans. Because of the dangers associated with these strains of bacteria, these bodies of water must constantly be tested to ensure the area is clean and safe for public use. Conventional bacterial sampling methods can range from 48-72 hours, which causes the water quality results to be outdated and inaccurate. This project addresses this problem by introducing magnetic nanoparticles (MNPs) as a new bacterial detection method to reduce the time for water quality results. In this project, MNPs were added to water samples to form MNP-cells and extracted using a neodymium magnet. The samples were plated on selective agar to differentiate the types of bacteria present. MNP-cells were then viewed under a microscope to confirm the identity. MNPs were able to extract and identify all strains of tested bacteria more efficiently and accurately when compared to the conventional bacterial sampling methods. E. coli, Vibrio spp., and Salmonella spp. were detected in the water samples. MNP bacterial sampling

was completed in 24 hours, successfully cutting down the conventional testing time. There are many benefits to using MNPs as a method of detection. This method does not require additional technology, which allows this detection method to be more accessible to developing countries. MNPs can also be used to test for bacteria in drinking water and food. Future research could look into using more selective media to test for even more types of pathogenic bacteria, which can help reduce the amount of pathogenic bacterial outbreaks worldwide."

Louanges Ndayishimiye
Michigan State University

Effects of Policy and Programs on Reducing Stunting Rate in Rural Parts of Rwanda

Purpose: Rwanda has experienced tremendous economic growth over the past decade and policy makers expected big improvements in nutrition status. However, Rwanda still has one of the highest child stunting rates in the world. The purpose of this is paper is to examine the effects policy and programs have on reducing child stunting in the rural parts of Rwanda. Design: In addition to a review of the literature, descriptive statistics were run to determine which variables to include in the model. A Logit model was estimated to determine the factors that are related to the reduction of stunting in rural Rwandan children. Findings: Children who live in rural areas in Rwanda are more stunted than those who live in urban settings. The remaining results concern rural children only. Boys have a higher probability of being stunted than girls. Less educated Mothers positively contributes to stunting. The distance to health care facilities as well as to a main road contributes to stunting rates since they are not close to where people live in the rural areas. Additionally, low dietary diversity in children in rural areas contributes to higher stunting rates. A program that assists rural people to own an animal so that they can increase their consumption of milk, meat, and/or eggs decreases the rate of stunting to a smaller extent due to families selling products from animals instead of consuming them. Implications: New and existing programs and policies need to encourage rural households to increase the diversity of food consumed. Public awareness campaigns that help pregnant women and children need to be implemented so that people, especially those in rural areas, can be aware of what needs to be done to reduce high rates of stunting. Also, community-based support groups can be created with committed leadership and intensive trainings so that they can encourage women and children to eat healthy meals. Moreover, the government needs to build more health facilities in rural areas.

Key words: Stunting, Rwanda, Policy and Programs"

Mara Eason
Adrian College

Soil Chemistry Plays a Role in Woody Plant Abundance in a Southeast Michigan Forest

Understanding community assembly processes in forests remains a major challenge in ecology. One hypothesis posits that species will specialize on soil conditions, including pH and nutrient levels, in a form of habitat filtering. However, empirical work has shown mixed results in forest communities. This research considers the role of soil nutrient levels and pH on the abundance and size of woody plants at Walden West, an environmental preserve in southeast Michigan. Soil nutrient levels were measured from bulked samples in eight 400 square meter quadrats. All trees and shrubs were mapped, measured, identified, and tagged. A number of correlations between abundance and some soil nutrient levels were found.

María José Nataren

Northeastern Illinois University

ESL Students Experience in Higher Education at Two Midwest Community Colleges

The population of English as a Second Language (ESL) students in the country has increased steadily in this decade. ESL students in higher education may face institutional barriers related to their language and background that in turn influence their classroom participation and campus involvement. However, research documenting the experience of English as a Second Language (ESL) students at the college level is relatively limited. Most of the research on ESL students focuses in primary and secondary education. The objective of this study is to gather ESL students perspective as to what specific barriers they face in higher education, and to learn about the services and resources that help them succeed in college. To do so we feature two institutions that serve large number of ESL students in an urban center in the Midwest. Our first case study is a private two year institution with selective enrollment serving traditional students transitioning from high school into college. The second case study is a public institution with open admission and a more heterogeneous non-traditional student body. The investigation explores students' self conception as ESL students, their academic and non-academic involvement within campus life, and their usage of institutional services. This research hopes to shed light on how ESL students experience higher education, and document preferred practices helping ESL students thrive at the college level.

Markiesha James

Jackson State University

Bioavailability of Depleted Uranium in US Army Shooting Range

The area of environmental toxicology has grown over the years due to the increased use of Uranium in nuclear weapon testing. Uranium is a naturally occurring heavy metal that is easily oxidized and mobilized. The isotope of interest is 238U which has a common presence in both biotic and abiotic environments, with the influence of radioactive properties on the environment being of interest. Assessment of the inherent environmental risks associated with Depleted Uranium (DU), a major waste product of uranium used for nuclear warfare, are necessary. Analysis of DU is important because it is a vital part of determining how these sites will be cleaned up and is largely based on the available research and previously recorded data about bioavailability. The goal of this study is to determine Depleted Uranium uptake and bioaccumulation in soil and plants from various areas within a US Army testing site. Representative soil and plant samples were collected from Yuma, AZ, a US bomb testing site. Acid digestion was performed on all representative soil samples to determine Depleted Uranium concentration. The study is ongoing. It has been hypothesized to be a direct correlation between Depleted Uranium concentration in the soil and plant samples. Through this study bioremediation methods will be further explored in hopes of improving soil quality, reducing toxicological harm.

Mia White
Michigan State University

Nutrient Fluxes of Chronosequences Jack Pine Stands

Jack pine stands, (*Pinus banksiana*), are typically managed through clear-cut harvesting; however, this can be done through either stem-only, or whole-tree harvest. Even though clear-cut management is ideal for the regeneration of fire adapted species, like jack pine, not much is known about the effects of stem-only vs. whole-tree harvesting on ecosystem nutrient budgets. We know that leaching losses of nutrients increase immediately following harvest, but the duration of time post-harvest before nutrient leaching stabilizes is a critical uncertainty that we are addressing in this study. We will evaluate the leaching of nitrogen, sulfur, magnesium, calcium, potassium, and phosphorus from jack pine stands using one-meter deep lysimeters and soil samples. Data for nutrient budgets will be extrapolated with a hydraulic model parameterized with applicable data. We have selected six Jack Pine stands in Grayling, Michigan that meet our requirements and cover a span of 59 years from the last harvest (youngest being 3 years and oldest being 59 years). We hypothesize that with atmospheric deposition and increased soil organic matter over time, the concentration of nutrients will stabilize (specifically the amount of leaching will be at a minimum) 40 or more years following a whole tree harvest. This study will lay down foundation for the sustainability of whole tree harvesting of jack pine stands on the soil.

Mikerobert Joseph
North Carolina Central University

*Workplace Stress in Black Americans: The Role of Religiosity and Coping Strategies
on Psychological Well-Being*

Given the continued economic shifts in recent decades and the stagnation of wages in the U.S. since the 1980s, there is a continuous need to understand the influence of workplace stress on the psychological well-being of those in the workforce (Pew Research, 2018). Black Americans who are overrepresented in low wage and low skill jobs are being subjected to an increased amount of workplace stress due to the upward immobility of income, increasing cost of resources and the need for productivity in the U.S. labor force (Wilson, 2018). Given that chronic workplace stress has been shown to be associated with adverse psychological outcomes (Mama et al., 2016), this proposed study will seek to understand the trends in that relationship within the current economic conditions, while also investigating the influence of factors such as religiosity and coping strategies used in response to stress. Pearson correlations and standard hierarchical regressions will be run to analyze the relationship between those variables based on a sample of Black Americans of low socioeconomic status (SES) from a Mid-Atlantic city. Contributing to this gap in the literature has implications for therapeutic settings and workplace policies that alleviate stress by providing proper staffing, training, and leadership. Furthermore, it is imperative that researchers and human service professionals be involved in developing broader economic policies addressing livable wages and adequate benefits for Black Americans of low SES.

Mohammed Aldossari
Oakland University

The Cultural Aspect of Counseling Supervision from Supervisees' Perspective

The purpose of this study is to understand the nature and the dynamic of the cultural aspects in counseling supervision through the lenses of the supervisees. The findings from this study will provide a deeper understanding of the supervisees' perspective during their counseling supervision journey. This research explores main concepts that play a significant role in multicultural competency in the counseling literature. Mixed methods were implemented to collect data to gain more understanding of the experiences of the participants. Semi-structured and unstructured questions were asked for the qualitative interview. In addition, a questionnaire was distributed among graduate students at a University in the central United States who had received counseling supervision. Furthermore, a focus group was conducted to obtain a comprehensive understanding. Observation was also employed to explore the cultural content discussed and examine the multicultural competency applied in a supervision session. Even though this is an ongoing work, noteworthy results are expected due to the importance of the data collected. Preliminary data suggests that the practice of culturally competent supervision is addressed theoretically in the counseling literature. However, participants reported that supervisors sometimes struggle to identify and address relevant cultural aspects that could inform their supervisory interventions in real practice. Therefore, more attention is required to bridge the gap between supervision theories and practices to fulfill the need for culturally-competent supervision.

Key words Supervisee, Supervisor, Cultural background, Supervisory relationship

Morgan Cheatham
University of Michigan

A New Metric for Evaluating Northern Hemisphere Growing Season Net Flux in Climate Models

Terrestrial ecosystems have removed approximately 25% of the carbon emitted to the atmosphere by humans, slowing the rate of climate change. Understanding these systems and their response to climate change requires quantification of the exchange of carbon between the atmosphere and land surface. However, large-scale land-atmosphere fluxes, including the Northern Hemisphere growing season net flux (GSNF), are difficult to quantify because ecosystem heterogeneity requires a higher density of direct flux observations than can be made, and indirect inference from atmospheric CO_2 observations is susceptible to uncertainty due to differences in the simulation atmospheric transport in models. Here, we develop a data-driven metric for the Northern Hemisphere GSNF from observations of atmospheric carbon dioxide concentrations collected during the HIAPER Pole-to-Pole Observations (HIPPO) and Atmospheric Tomography mission (ATom) flight campaigns. These campaigns sampled the atmosphere over the remote Pacific from ~80°N to ~60°S, attaining vertical profiles from near the surface to an altitude of ~10 km. We use the data from the flight campaigns, which span all seasons over a time period of nine years, to fit a seasonal cycle of atmospheric CO_2 mass in the Northern extratropics (20° - 90°). We infer the growing season net flux by taking the derivative of the observed seasonal cycle after using the CarbonTracker system to account for mixing of the atmosphere at the southern and upper boundaries of our domain. We use our observationally derived GSNF to evaluate carbon cycle simulations from the Coupled Model Intercomparison Project (CMIP) phase 6 Earth system models. While the model-to-model spread in GSNF

has decreased relative to that of the (CMIP) phase 5 models, there is still disagreement on the magnitude and timing of seasonal carbon uptake. Our research shows that the GSNF inferred from these aircraft observations provides an additional constraint on these models that may ultimately improve our ability to accurately predict carbon-climate feedbacks.

Nadia Nasri

Siena Heights University

The Comparison of Clinicians' and the General Population's Perceptions of Verbal and Emotional Abuse

The purpose of this study was to examine the differences in perception of verbal and emotional abuse between clinicians and the general population in order to assess society's current awareness and understanding of these forms of abuse. Verbal and emotional abuse are two forms of abuse that affect the overall well-being of a person. Verbal and emotional abuse are often underreported and understudied. This may be due to the false idea that these forms of abuse are not as harmful as physical and/or sexual abuse, despite the fact that the effects can be even more damaging. Verbal and emotional abuse are also difficult to detect because of the lack of physical evidence, rendering these forms of abuse to have an invisible presence in our society. Participants of this study included licensed clinicians and members of the general population who were administered an original survey to test their general knowledge and perceptions of verbal and emotional abuse, such as the behaviors, effects, and attitudes. There were two hypotheses for this study. The first hypothesis was that clinicians would report higher levels of agreement with what constitutes verbal and emotional abuse than will the general population. The second hypothesis assessed was that clinicians would report higher levels of agreement about the negative impacts of verbal and emotional abuse than will the general population. The results were mixed in their support but generally consistent with the hypotheses. However, they were suggestive of an effect deserving further research.

Nicolas Herard

University of Arizona

Identifying Causes of Flaw Formation in Metal Additive Manufacturing

It has been observed that there are laser-particle interactions during additive manufacturing builds. Furthermore, it is hypothesized that these interactions can lead to flaws in the final build. Therefore, preliminary identification of these interactions can help predict mechanical properties and fatigue life of the final build. The purpose of this research was to use sensor data taken during a build and find anomalies that correlate to flaw formation.

Nataya Ford and Courtney Hart

North Carolina Central University

Write Now, We Will Heal: A Tale of Two Cities

Efforts to address health disparities by federal agencies have begun to not only look at ecological and structural influences on health outcomes among African Americans, but they are advocating the use of community-based interventions that will increase health knowledge, screening, and health related behaviors. The use of theaters to address health disparities has been used to increase knowledge of breast cancer, cardiovascular disease, and HIV/Aids (Gray. R. et al 2000; Stuttaford et. al 2006; Livingston et. al 2013). Studies using ethno-dramas have found significant increases in knowledge and prosocial related health behaviors among African Americans (Smith et. al 2008; Reed et. al, 2015). The current study sought to evaluate the utility of theater in addressing cervical cancer in communities of color. Over the course for two weekends an educational ethnodrama was conducted discussing risk factors, symptomology, and common knowledge surrounding Human Papilloma Virus (HPV) and cervical cancer in community theaters in Durham and Charlotte, North Carolina. Using a standard pre/post-test design and retrospective pre/post-test delayed time series design, over 100 playgoers participated in the ethno-drama experience intervention. Using paired sample t-test and independent samples t-test, the results of the tests showed that there were significant increases in awareness, understanding of prevention and control methods surrounding HPV and cervical cancer, and overall cervical cancer literacy among Durham participants, but only significant increases in understanding of prevention and control among Charlotte participants.

Noelle Mongene

Oakland University

The Association between Post-traumatic Stress Symptoms and Subjective Well-being is Moderated by Culture in Native Americans

Previous research has identified tribal identity, spirituality, ceremonies and rituals, oral tradition, and social support as important mechanisms of resilience in Native Americans. The current study further examined possible mechanisms of resilience in Native Americans. A community sample of individuals who self-identified as Native American (N = 83) completed an online survey assessing potentially traumatic events, symptoms of post-traumatic stress, and subjective well-being using validated measures. Demographic questions included items assessing the degree of involvement in Native American cultural activities. Multiple regression analysis revealed that the interaction between PTSD symptoms and cultural involvement was a significant predictor of subjective well-being (b = .00, t = 2.06, p < .05) with an R2 of .04. Simple slopes testing determined that when cultural involvement is low, symptoms of post-traumatic stress significantly predict poor well-being and when cultural involvement is high, symptoms of post-traumatic stress do not predict poor well-being. The findings provide support for the previous research indicating that different aspects of culture are important mechanisms of resilience in Native Americans. The findings suggest that culture should be an integral part of education for Native American children and that interventions to increase resilience in Native Americans who have experienced adversity should focus on culture.

Phylicia Richardson

Roosevelt University

MSU Support Staff Engagement: A Survey Study

Work engagement is defined as whether an employee feels satisfied with their work outcome and if they have a sense of pride for their employer. Positive work engagement benefits both the company and its employees through increased productivity. Recently, MSU has implemented a closed Facebook group for Support Staff. Using data taken from a post-Facebook intervention survey of MSU employees, we describe the effect of a number of measures of engagement on job satisfaction and engagement. There were 141 benefits-eligible MSU Support Staff, that mainly consisted of white middle-age females who participated in the web-based survey. In order to do this, we regressed the Facebook group attitude and work-life balance on job satisfaction and worker engagement. Participants who reported a positive work-life balance also reported a positive response to feeling satisfied with their job and more engaged. There was no direct effect of engagement with the Facebook group attitude and job satisfaction or engagement. Results suggest that work-life balance is essential for support staff at MSU. A useful intervention may be considering structural of environmental factors to improve work-life balance for Support Staff.

Sebastian Morales

Northeastern Illinois University

To What Extent does having Culturally Sensitive Retention Efforts Impact
Retention of Male Latino College Students?

Recent studies have shown that less than half the number of Latino students who enroll at a four-year university actually complete their degree. The dropout rate is at higher for Latino male college students. Literature tell us that compared to their female Latina counter parts, male Latino students are more likely to have poorer graduation rates, and many leave higher education with a negative view of their college experiences. The purpose of this research is to investigate the impact that culturally relevant retention programs and culturally relevant teaching have on first generation male Latino student academic success. We want to explore how culturally relevant activities relate to their tendencies to drop out of college or university. To do so, I will survey two groups of male Latino students at an urban, four year, Hispanic Serving Institution in the Midwest of the United States. I will look at two groups of first generation male Latino students. One group will be enrolled in a program that works with students who do not meet the regular university admissions standards. This program is designed to serve specifically Latinos and prepare them through a culturally relevant standpoint. The second group will be male Latino students enrolled a first-year experience course at the same university. The results of the survey will be compared to see if being involved the program that teaches from a culturally relevant standpoint influences Latino male retention.

Sedzro Tamakloe

University of Maryland, Baltimore County

Economic Benefit of Photovoltaics in Michigan Field Crop Farms

The total annual consumption of energy in the U.S. agricultural sector is 1,872 trillion Btu which was 1.9% of total U.S. consumption in 2016. Photovoltaics (PVs) are an option to reduce energy consumption from the grid. There has recently been changes in policy in Michigan which earlier restricted the installation of PV on agricultural land. This change is likely to increase the number of agricultural farms installing PV onsite. In this study, the economic benefits to farmers are quantified when a PV system is installed in agricultural field crop farms of Michigan. The optimal design of PV system in farms should use hourly energy consumption data, which is not currently available in public domain. To bridge this data gap, we model the hourly electricity consumption from a typical agricultural farm operation using BEopt 2.8. Homer Pro is used to optimize capacity and assess the economic benefits of a PV system by simulating its operation on an agricultural farm for ten years. The effect of weather conditions on PV generation is simulated by using the weather data from Freeland, Michigan obtained from the National Renewable Energy Laboratory. The required PV capacity to offset the electricity demand and sell-back to the grid is determined and the associated cost benefits are calculated for a grid-connected agricultural farm. The farm electricity consumption and cost of operation reduce with the use of PVs. The implementation of net metering saves farmers money on their electricity expenses. The annualized cost was reduced for scenarios 2 and 4 with net metering.

Keywords: Photovoltaics, electricity consumption, agricultural crop farms, economic benefit"

Selina Williams

Northeastern Illinois University

Health Disparities Among the Black Community in Chicago

African Americans have one of the poorest health outcomes in the United States. In the Southside of Chicago, African American communities lack infrastructure, street sanitation, safe housing and safe environmental conditions. These areas also lack fresh markets and grocery stores. The lack of access to affordable health care and food deserts are main obstacles to the wellness of African American residents in these zones. This lack of adequate health care has, directly and indirectly, exacerbated the incidence and prevalence of chronic diseases among this population and resulted in widening health disparities between not just the African Americans but other demographic groups in the city as well. The purpose of this study is to investigate the social determinants of health among African Americans living in the southside of Chicago in order to propose strategies to eliminate health disparities. I will conduct in-depth interviews with community members at a low-income southside African American community. Each participant will answer several health-related questions regarding their community and personal life. I will transcribe the interviews and code the transcription for themes and categories. I will find common themes in each interviewee's testimony and build conclusions based on those questionnaires'. This qualitative study will compare built environment, economic stability, and education on health outcomes of community's members. This study will ideally provide insight of the health disparities that exist in these black communities. This research will propose new strategies that will help improve the health outcomes in black communities.

Serenia Fulcher

North Carolina Central University

Do Lesbians have Safe Sex?: Exploring the Relationship between Sexual literacy, Sexual Scripts, Self-esteem and Sexual Self Efficacy among Black Lesbians

Young black lesbians are marginalized and narratives about them are nested in conflicting intersections. These women experience racism, sexism, and homophobia and often perceived negatively when addressing safe sexual practices. Current data on STIs for this population suggest lower rates (CDC, 2015), thus they may receive fewer messages on how to perform sex safely. This can be problematic given the increased number of individual who self-identify as lesbian during college, a period of sexual exploration. This prompts the question of their engagement in safe sex. This engagement is informed by their sexual health literacy and their ability to use self-efficacy in sexual encounters. Although the relationship between the two seems strong, it can be moderated by sexual scripts or internalized ideas about sexual frequency and casual sex. Researchers suggest that regardless of sexual literacy, sexual scripts have the potential to influence an individual's sexual self-efficacy (Curtin, Ward, Merriwether & Caruthers, 2011). The present study seeks to assess the relationship between Sexual Literacy, Sexual Self-Efficacy, and Sexual Scripts as well as the moderating role of sexual scripts. To investigate this relationship a sample of 120 participants who identify as Black Lesbians will be solicited from a mid-size mid-Atlantic city. Pearson correlations, linear and, hierarchical regressions will be run to assess associations and the moderating role of social scripts. This study can contribute to the literature by providing empirical evidence for clinicians and educators to develop comprehensively inclusive sexuality education programs that address sexual scripts and teach college students how to use sexual self-efficacy in sexual encounters.

Suliat Akinyele

Northeastern Illinois University

Aging in Place for Grandparents: Differences in Life Satisfaction and Life Adaptation

More than two million Americans live in long-term care facilities and other long-term care facilities. The purpose of this study is to examine potential differences in the life satisfaction and life adaptation between healthy older adults living in their homes and those living in a long-term care facility. This study will be using the person-environment "fit" to understand how older adults are living in their daily lives. As well as to understand if their environment affects them as they age in place. The research wants to find out the physical and social setting that will create a developmental fit for older adults. Also, finding a comfortable environment for older adults that are aging in place and for those who care for them. This study aims to find out factors that lead older adults into a long-term-care facility rather than aging in place in their own home. This study uses both quantitative and qualitative methods. The research will survey older adults from age 55 and over about their satisfaction with living at home or living in a long-term care facility. The study will collect demographic information to see how these factors are related to their satisfaction. The qualitative method explores issues of health and family relations to understand how these affect their decision to live in a long-term care facility.

Taylor Kovach

Michigan State University

Family Factors, Attachment and the Impact on Mental Health

This research investigates family factors and their importance to mental health. Family factors refer to such issues as family structure, inter-parental conflict, and attachment. A specific focus will be on attachment. Research is supportive of the importance of attachment. Research shows that attachment has an important influence on mental health, and seems to contribute to depression, anxiety and other mental health concerns. The family setting is discussed as an important issue in this set of outcomes. This paper will present the evidence on family roles, relationships and problems as they affect mental health. I then discuss the critical role of attachment and attachment disorders in the relationship to mental health outcomes.

Victor Gipson II

University of Georgia

Does XEN Cell Epigenetic Memory Influence Reprogramming Outcomes?

In 2006, Takahashi and Yamanaka published a paper detailing their success in deriving pluripotent stem cells from a non-embryonic source which were called induced pluripotent stem cells (iPS cells). In 2016, Parenti found that a new type of stem cell, dubbed induced extraembryonic endoderm cells (iXEN cells), were produced with iPS cells when reprogramming. The ratio between these cells is 1:3 iPS:iXEN. iXEN cells mimic naturally occurring extraembryonic endoderm cells (XEN cells) from the embryo. XEN and iXEN cells are multipotent. They can become yolk sac and visceral endoderm cell types. The goal is to determine why some cells become iPS cells and others become iXEN. This will help us understand what controls cell fate during development or reprogramming. My hypothesis is epigenetic memory influences reprogramming outcomes. If the hypothesis is correct, reprogramming XEN cells will produce more iXEN cells than iPS cells. I will derive mouse XEN cells with the rtTa Tet-on OSKM gene which makes the reprogramming factors inducible through doxycycline treatment. After reprogramming, I will utilize immunofluorescence and qPCR analyses to determine if XEN cells are primed to become iXEN cells due to epigenetic memory. We were not successful in deriving XEN cells from the embryos possibly because we tried deriving XEN cells too early. To address this, embryos will be outgrown longer before extraction.

Viviana Jimenez

Roosevelt University

Preliminary Evaluation of Degeneration Process in Paenibacillus polymyxa During 2,3-butanediol Production

Paenibacillus polymyxa, a gram-positive bacterium, produces 2,3-butanediol (2,3-BD) from sugars and agricultural residues. Microbial 2,3-BD production serves as an alternative source to produce 1,3-butadiene, the monomer for the manufacturer of synthetic rubber. Production of 2,3-BD occurs via mixed acid fermentation pathway, involving generation of competing products ethanol, acetic acid and lactic acid. Acetic acid production by *P. polymyxa* during exponential growth phase results in the generation of ATP used for growth. During late exponential growth phase, *P. polymyxa* re-assimilates and converts the acetic acid to 2,3-BD. Recently, we found that *P. polymyxa* lost the ability to re-assimilate acetic acid during 2,3-BD fermentation after repeated cultivation - 'degeneration'. Degeneration leads to a loss of 2,3-BD production, sharp decrease in culture pH, and premature termination of the fermentation process. DNA isolation studies indicate that *P. polymyxa* harbors a plasmid DNA that may contain genes yet to be identified or annotated. We hypothesize that the gene(s) involved in acetic acid re-assimilation may be contained in the plasmid, and the loss of the plasmid in *P. polymyxa* will result in degeneration of acetic acid. Consequently, this study focused on the isolation of plasmid DNA from *P. polymyxa* wildtype (WT) and degenerated strain (DS), 2,3-BD fermentation using both strains, and their comparison to delineate possible mechanisms for degeneration. Our findings show that while *P. polymyxa* DS lost both acetic acid re-assimilation and 2,3-BD production capability, but not its plasmid. Further studies are required to unravel the underlying mechanisms leading to degeneration in *P. polymyxa*.

Zachary Luther

Michigan State University

What Incentives Are Needed to Encourage Farmers to Plant Biodiversity-Promoting Prairie Strips?

Conventional agriculture can introduce societal costs by reducing biodiversity around farmland and by affecting water quality far from the farming site. One practice farmers can use to combat these environmental consequences is to plant strips of native prairie species within crop fields. Recent research shows these "prairie strips" provide many environmental benefits by promoting biodiversity and reducing soil erosion and nutrient runoff potentials. Prairie strips also incur costs to the farmer, including: establishment costs (e.g. seed and site preparation), management costs (e.g. herbicide and pesticide applications), and the cost of sacrificing crop revenue to plant these strips (i.e. "opportunity costs"). If outside institutions wish to encourage adoption of prairie strips due to the societal benefits, it may be necessary to compensate farmers for these costs. Using responses from a survey of a large, stratified sample of corn and soybean farmers in four Midwestern states, we measure farmers' "willingness to plant" prairie strips in exchange for payment. We asked respondents if they would enroll in a 10-year contract in which prairie strips would occupy 5% of the respondent's largest field, in exchange for a payment ranging from 50% to 200% of expected crop revenue that would be forgone to do so. Willingness to plant increases with payment level up to $350 per acre per year, at which point ~55% of farmers would enroll. By eliciting information about farmer traits and attitudes on prairie strips and the environment, we are also able to determine potential factors that influence farmers' willingness to plant.

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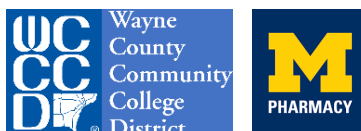
MSU AGEP Program Staff

Steven Thomas- Conference Chair and Program Manager

Steven is a Program Manager at The Graduate School (TGS) at Michigan State University. He manages diversity recruitment for TGS as well as the daily supervision for two programs including: the MSU Alliance for Graduate Education and the Professoriate (AGEP) and the Summer Research Opportunities Program (SROP). Prior to working with The Graduate School, Steven also worked for the Colleges of Human Medicine, Engineering and Natural Science at MSU. Steven Thomas has experience in research, technical writing, natural product chemistry, project management, and science education. He has worked in the US and overseas for both industrial and academic employers such as Bristol Meyer Squibb and Northwestern University. Steven has also worked for Morgan State University as technical writing consultant for The Baltimore Region Environmental Justice in Transportation Project (BREJTP) and as a science consultant for the Charles H. Wright Museum for African-American History. Steven's international experience includes working for Cornell University's Minority Health International Research Training (MHIRT) Program in the Dominican Republic. Mr. Thomas is also a member of the National Organization for the Professional Advancement of Black Chemists and Chemical Engineers (NOBCChE) and the American Society of Pharmacognosy. Some of his research has been published in the International Journal of Pharmaceutics and Applied and Environmental Microbiology Journal. Steven also works with the NSF-sponsored ASPIRE project which works with universities across the country to support diverse STEM faculty recruitment and culturally-responsive faculty training. Steven obtained his masters in organic chemistry from Michigan State University. He also holds a bachelor's degree in chemical engineering from the University of Michigan, where he also was a former lecturer.

Duke Augustin-Graduate Assistant
Duke assists in planning and implementing workshops, community meetings, conference and recruitment events, as well as managing program alumni communication. Duke is a master's student in the Health Risk and Communication Program, and his research interests are in vaccinations.

Jared Milburn– Media Specialist
Jared holds a BA in Media Arts and Technology with a specialization in TV Cinema and radio and minor in Theatre from Michigan State University. He currently earning his MFA in Digital Rhetoric and Professional Writing. He conducts video interviews of current students and alumni.

Nicholas Reeves-Program Assistant
Nicholas assists in planning and implementing community meetings and recruitment events, as well as manages social media strategies. Nicholas obtained his BA from MSU's Marketing program.

Valerie Coakley- Program Assistant
Valerie assists in event logistics and vendor relations. Valerie is completing her BS in the Biomedical Laboratory Sciences program at Michigan State University.

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 will provide a key to changing the culture of U. S. colleges and universities to embrace building world-class STEM and Social, Behavioral and Economic 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 AGEP Community represents **75%** of doctoral students at MSU who are Black, Hispanic or American Indian citizens that in NSF sponsored departments. **90%** 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 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. The 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