

Michigan AGEP Alliance Fall Conference
Kellogg Hotel & Conference Center
Michigan State University, East Lansing, Michigan
September 15, 2018

Student Abstracts

CrossTalks & Posters

CrossTalks: 16 Student Oral Presentations
8:30 AM – 10:30 AM

Room 104 AB with Facilitator: Dr. Siomara Hernandez-Rivera
Room 105 AB with Facilitator: Dr. Salako Oluwaseun

Poster Session: 24 Poster Presentations
1:45 PM - 2:45 PM
Big Ten Room A

MICHIGAN STATE
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Student Oral Presentation Abstracts
Room 104 AB

Breanna Sue Demaline
Northern Michigan University

Fear in the Veterinary Clinic: History and Development of the Fear Free Initiative

Concern for fear, anxiety, pain, and stress in companion animals in the veterinary setting has existed for decades. However, this concern did not translate into published material until approximately 2012. Gaps in material, education, and research may have led to the delay in change in the veterinary professional community. Tracing the history and development of the Fear FreeSM initiative, this research project will reveal a material gap starting in 1999, the absence of thorough animal behavior educational curricula, and the transition from the acceptance of fear, anxiety and stress (FAS) in the veterinary clinic to an expectation of FAS-free visits. This research project will not be outlining fear in domestic animals, but rather fear, anxiety and stress as it has been addressed in the veterinary community.

Courtney Bryant
Michigan State University

Calling in Black: An Investigation of Racial Trauma in the Workplace

Researchers have shown how witnessing police violence against Black people may cause racial trauma- a psychological injury that overwhelms a person's capacity to cope, resulting in debilitating grief, hopelessness, and fear. Despite this reality, Black employees may feel pressured to maintain their ordinary demeanors at work. The organizational literature has yet to address this phenomenon, leaving a gap in understanding employees' well-being and workplace outcomes, as well as organizational outcomes. In this paper, we take a positive psychology lens to propose a theoretical model that explains how racial trauma can play out in the workplace with an emphasis on the role of individual and organizational resourcing as mitigating factors. Next, we present three separate ongoing investigations that provide evidence to support and extend the model. Finally, we discuss the future directions and practical implications of this research.

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Joe Bormeh Faryean
Michigan State University

Nerve Inflammation is Associated with Pain in Guillain Barré Syndrome

Guillain Barré Syndrome (GBS) is the leading cause of acute paralysis in the United States. Affecting approximately 1 in 100,000 people annually, Guillain Barré Syndrome is characterized by ascending limb paralysis. In previous studies, NOD CD86^{-/-} mice have been found to develop Spontaneous Autoimmune Peripheral Polyneuropathy (SAPP) after 20 weeks of age. Previous work determined that SAPP closely mirrors the Acute Inflammatory Demyelinating Polyneuropathy (AIDP) form of GBS in people. As a result, these inbred mice with SAPP can serve as a good model for the study of GBS. Mice that developed SAPP had increased inflammation in their Sciatic Nerves and Dorsal Root Ganglia (DRG). These mice also showed phenotypic signs of pain according to the Mouse Grimace Scale (MGS). We hypothesized that NOD CD86^{-/-} mice that displayed signs of pain will have increased inflammation in their peripheral nerves compared to the control groups. To test our hypothesis, two strains of mice were used: NOD WT and NOD CD86^{-/-}. NOD WT mice served as the control group and the NOD CD86^{-/-} mice served as our experimental group. The NOD WT and NOD CD86^{-/-} mice were put through the open field test and their performance recorded on a camcorder for two to three minutes. The videos were analyzed using the MGS to determine pain levels. The mice were humanely euthanized, and their Brachial Plexus, DRG, and Sciatic Nerves were dissected, and embedded en bloc in paraffin. Blocks were sectioned and stained with anti-CD3 and anti-F4/80 antibodies to detect T cells and macrophages, respectively. Thereafter, nerve sections were analyzed using morphometry to determine levels of inflammation. Kruskal-Wallis One Way Analysis of Variance on Ranks with Dunn's post-test was performed on the results to determine statistically significant differences between the treatments groups. There was increased infiltration of T lymphocytes and macrophages in the peripheral nerves of NOD CD86^{-/-} mice when compared to the NOD WT mice. Results of the study indicate NOD CD86^{-/-} mice that displayed phenotypic signs of pain had increased inflammation in their peripheral nerves. This was the result of damage to the sensory nerves due to immune mediated inflammation. The results indicate that pain may be useful as a marker of disease progression and efficacy of treatment for studies in mouse models aimed at developing new interventions for human GBS cases.

John D Tran
Michigan State University

Plant Transporter Proteins Susceptible to Monolignol Toxicity

Lignin is a highly recalcitrant molecule that contributes to the rigidity of plant cell wall. Many of the genes involved in lignin biosynthesis have been identified over the past decade with some being characterized only recently. One of the long standing questions involving lignin is how the monomers of lignin, known as monolignols, are translocated from the cytoplasm which is the site of synthesis, to the apoplastic space where they undergo radical coupling to produce lignin. We believe that it is likely that specific transporters mediate this transport and we have selected a number of candidate genes for such transporters from several RNA-seq datasets using co-expression analysis. We are screening these candidates transporters using *A. thaliana* T-DNA insertional lines for phenotypes often observed in lignin deficient plants such as reduction in stem width, changes in lignin monomer composition, and increases in cell wall digestibility. The successful characterization of the monolignol translocation process would provide insight into a critical phase of cell wall development and have potential for advancing biofuel technology. We will report on several *A. thaliana* T-DNA lines with phenotypes likely to be associated with lignin biosynthesis.

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John Albert Vasquez
Michigan State University

*To Be or Not to Be: How the Postdoctoral Research Experience Influences
Career Trajectories of Future Scientists*

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 United States and that number is steadily increasing due to the fact that the post doctorate has become the de facto next career step following completion of a doctoral degree (NPA, 2014). When asked why they took their positions, 74% of postdoctoral scholars in the life sciences and 46% in other disciplines said the reason for doing so was to increase their chance of getting a faculty position (Sauermann & Roach, 2016). However, the number of postdoctoral researchers has increased 150% between 2000 and 2012, “far surpassing” both the percentage increases in graduate students and tenure-track faculty positions available over that same period (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). A closer understanding of the changing picture of postdocs and their career development in today’s higher education landscape is needed. The purpose of this study is to understand the career development of current postdocs and specifically, why did they choose to become a postdoc what information and experiences did they expect to gain in their research experiences that would help them get a position in academia, and how has this information affected their current career trajectory.

Joelyn de Lima
Michigan State University

Contextual Differences Influence Model Architecture

Scientific models are specialized representations that explain or predict a concept, process, or phenomenon. Models are of great importance in the generation, evaluation, and communication of scientific knowledge. As a consequence, models have been included in the standards and required curricula for science at K-12 and university levels.

As a tool, models lend themselves to both authentic instruction and assessment. However, student-constructed models can give us insights into student thinking and reasoning that are not captured in multiple choice or even narrative responses. Features of model architecture have been used to gain insights into aspects of students’ cognitive structures, such as the robustness or connectedness of their understanding. We asked whether item feature context (i.e., variables in a question prompt) impact the architecture of students’ constructed models of evolution.

We asked students in large (n=384) introductory biology courses how a biologist would explain the evolution of traits in humans and in cheetahs. Students had to provide their responses by constructing models. We then analysed model architecture by measuring size and complexity.

We found that: (1) size was comparable for both contexts, (2) models about cheetahs were more complex, (3) models about humans were more likely to be linear (zero complexity), and (4) student performance (measured by incoming GPA) did not contribute to explaining much variation in the data.

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Our results indicate that contextual features of the prompt are eliciting some differences in model architecture. This could indicate the cognitive structure is more connected when they are reasoning about cheetahs.

Stephanie Haft
Western Michigan University

Cross-cultural Barriers in the Implementation of Western Psychological Assessment: Assessing Pediatric Psychopathology in Samburu, Kenya

Normative data for the Child Behavior Checklist (CBCL: Achenbach, 1991) has been established worldwide in more than thirty languages to document behavioral and emotional problems in children (Ivanova et al., 2007), most recently in preschool children on the coast of Kenya in Kiswahili (Kariuki et al., 2016). A semi-structured interview was created for an abbreviated Child Behavior Checklist (CBCL: Achenbach, 1991) for both the preschool and school-age versions in this population. The CBCL/6+ assessed for multiple empirically-based syndrome scales: anxious/depressed, withdrawn/depressed, thought problems, rule-breaking behavior, and aggressive behavior. The CBCL/1½-5 assessed for emotionally reactive, anxious/depressed, withdrawn, attention problems, and aggressive behavior. In the current project, the CBCL was administered to caregivers of Samburu children along with collecting data on physical measures (i.e. height, weight, skinfold measurement, tibia length, etc.), saliva samples, and a behavioral task to measure generosity. Implementation of Western psychological assessments in non-Western settings creates unavoidable cultural issues. Although one may have a linguistically-sound, culturally-adapted, and ethical translation of a measurement tool, there are numerous cross-cultural barriers that need to be considered during both the assessment and data interpretative processes. In particular, the effort and cultural insight required to have valid and reliable measurement and a working therapeutic alliance are the forefronts of this discussion. For example, in Samburu, parenting is communal, involving biological parents, co-wives, aunts, uncles, grandparents, older siblings, warriors, elders, and other community members. Caregivers thus were selected by their physical proximity and emotional closeness with the child in the last six months. Caregivers were excluded if they did not share meals regularly with the child, live in the same settlement, or have been physically separated from the child for an extended period of time within the last six months. In the proposed presentation, I will discuss challenges encountered in administering westernized assessments in a cross-cultural context. By situating my personal experiences working on an interdisciplinary project among members of the Samburu trip in Kenya in the existing scholarly literature, I will discuss some barriers we encountered as well as implications for cross cultural research.

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Sherall Elaine Wade
Eastern Michigan University

Building Effective Student Support Teams (to Help Students Soar)

Purpose: To examine the student support strategies of one urban elementary public-school academy based on the research of Dr. James P. Comer's "School Development Program."

Methods and Outcomes: This case study utilized mixed method methodologies, as well as secondary data to support component findings. It revealed the perceptions of elementary school staff and administrators involved in a school-wide student support team effort to improve student achievement and to decrease the over-representation of minorities into special education. Surveys and interviews captured attitudes and strategies of the participants. A pilot study utilizing quantitative methods (pre-and post-test scores) revealed the outcomes of this seven phase intervention model.

This study examined the practices of a school-wide initiative designed to meet the needs of every struggling learner. The Detroit Student Development Support Team Model is a multi-faceted intervention program designed to serve students' cognitive, psychomotor and affective needs with the support of teachers, parents and community stakeholders. With a multidisciplinary approach, this program aimed to use team efforts as a means of improving student achievement.

The following questions guided this study:

1. What factors facilitated and/or inhibit the implementation of the Student Support Team?
2. How did implementation of the Student Support Team model impact students' learning?
3. What factors contributed to the referral of students to the Student Support Team Process?

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Room 105 AB

Rachel Bruinsma
Wayne State University

Effects of Specific Pain-Related Emotional Disclosure and Partner Responsiveness in Chronic Pain Couples

Chronic illness impacts half of American adults, with chronic pain being the most common disability (Ward, Schiller, & Goodman, 2014). Situational relationship satisfaction has been shown to lower pain response in couples (Corley et al., 2016). However, the existing literature has not specified what exactly contributes to situational relationship satisfaction. The present study examines specific forms of pain-related emotional disclosures made by an individual with chronic pain (ICP) and specific forms of responsiveness provided by his/her partner during a 10-minute discussion of how the pain has impacted their lives and their relationship. Data is drawn from a larger study examining the effects of partner validation on couples in which one individual has chronic pain and the other has little or no pain. Videos were coded for emotional disclosures including anger, sadness, anxiety/catastrophizing, and guilt and responses including validation, invalidation, problem-solving, and reassurance. While interrater agreement for the emotion codes was adequate (Kappa > 0.9 for all codes), it was lacking for partner response codes (Kappa < 0.8 for all codes). This has forced us to re-examine our codes and consider the importance of interrater agreement as it pertains to the internal validity of the study before we can proceed to further analysis. Presently, I seek to explain how the potential for bias has put the internal validity of my study at risk, the importance of internal validity in research such as mine, and how I plan to address it.

Vanessa Yan Yan Lee
University of Detroit Mercy

Provision of Transportation for Health Outcomes for Older Adults

PURPOSE: The purpose of this pilot study was to investigate the impact of preventive health care attainment for adults (aged 65 years and older) to determine if there is a significant relationship with the presence of transportation services geared specifically toward this population cohort. By the year 2050, one in five people will be over 65 years old in the United States (US) (Kotval-K, 2017). The lack of available and adequate transportation services poses a challenge for older adults whom require frequent health care appointments. (K-Kotval, 2017).

METHODS: The project aims if there is a significant relationship between the presences transportation services and the attainment of preventive health services for Older Adults. The Assessment of Transportation Options for Older Adults in the Tri-County (Clinton, Eaton, Ingham) Region of Michigan Survey is used to evaluate on the opinions and usage of the available transportation options that residents 55 years and old and above have in their town/city.

HYPOTHESIS: We predict that communities with free or reduced rate transportation services for older adults would have a higher prevalence of older adults that have attained preventive services, compared to areas with no transportation provisions in place. **RESULTS:** This project would enable communities and researchers to associate transportation infrastructure with health outcomes at a geographic level. The results constructs a more consistent transportation outline geared for older adults in 3 counties around Lansing, MI (Clinton, Eaton, Ingham) leading to a higher prospect of successful aging in-place and promoting an active lifestyle for this population.

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Jackquelin Quinn Bristol
Northern Michigan University

*Comparative Study of Integration and its Role in Students' Perceived Social Support on
Predominantly White Campuses*

Using the Interpersonal Support Evaluation List- Shortened Version-12 Items (Brummet, n.d.) and a modified version of the College Student Experience Questionnaire (Pace, 1984) students at a predominantly White Midwestern university were surveyed. The purpose of the survey was to explore whether students from different racial groups had different correlation coefficients between the amount of integration on campus and their perceived social support. Integration, the independent variable in this study was operationalized as the participation in student organizations, interactions with faculty and peers, and usage of campus facilities. Perceived social support, the dependent variable in this study, was defined as support that an individual believes to be available, regardless of whether the support is actually available ("Social Support (SOCIAL PSYCHOLOGY) - IResearchNet," n.d.) A review of literature led to the following hypotheses. (1) Minority students involved in student organizations will report higher levels of perceived social support overall. (2) The correlation coefficient produced between integration and perceived social support will be stronger for minority students than others. (3) First generation White students will have a similar correlation coefficient as minority students. This project is likely to have consistent findings as the similar work done by other authors (Fischer, 2007; Hurtado & Carter, 1997).

Connie A Rojas
Michigan State University

Host Reproductive State and Ecological Environment Shape the Gut Microbiota of Spotted Hyenas

Microbes colonize nearly every surface of their hosts, and once established they form highly regulated and complex communities, termed 'microbiota'; which collectively greatly impact their host's physiology, behavior and fitness. In the mammalian gastrointestinal tract, resident microbes are known to synthesize essential vitamins, supply their host with energy released from the fermentation of indigestible carbohydrates, protect from pathogens, and promote immune system and tissue development. Furthermore, alterations to the structure and stability of these communities has functional consequences for the host and the types of services these microbes may be providing. Thus, a major goal of microbiome research is to not only to understand how microbes may be affecting their hosts, but also how hosts are influencing their endogenous microbiota. While much research has been conducted on the gut microbial communities of humans and primates, very little is known about those of mammals in the wild. Here, I use next-generation amplicon sequencing technologies to investigate the gut microbiota of a wild carnivore, the spotted hyena (*Crocuta crocuta*), and specifically, a) determine the functional contributions of the microbiota to host fitness and b) evaluate whether host familial ties and reproductive state, as well as ecological variables such as season, prey abundance, and group size influence the structure and function of these communities. Ultimately, I hope my research contributes to our understanding of host-microbial interactions, the host factors driving variation in the microbiome, and the microbiome's influence on host phenotype.

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Tiffany D Ceasar
Michigan State University

Africana Women Leaders of African Centered Education: A Portraiture of Mothering, Pan-Africanism, and Nation-Building in Africa

The study focuses on the cultural phenomenon of Black women such as Makini Tchameni who have established African-centered schools in Africa. The case in particular examines how Africans in the Diaspora, particularly a black woman from the United States, Makini Tchameni, contributes to the African Renaissance through African Centered Education. She is the co-creator of the ACE Foundation that has contributed to the development of two African Centered Schools in South Africa and Cameroon.

Sevan Chanakian
Michigan State University

Exploring New Materials In Search of Higher Heat to Electricity Conversion Efficiency

Thermoelectrics are devices that convert heat to electricity and vice versa by take advantage of the Seebeck effect—the property of a material that converts a heat gradient when an electric current is applied. The conversion efficiency of a material is proportional to $zT = (\alpha^2 T) / \kappa \rho$, the material's thermoelectric figure of merit. zT is dependent on the Seebeck coefficient, α , thermal conductivity, κ , and resistivity, ρ —thus a good thermoelectric exhibits phonon-glass, electron-crystal behavior. However, these materials properties are intimately interconnected which makes it challenging to discover and engineer materials with a large zT . We will discuss a few strategies used to optimize zT . In particular, we will be discussing approaches to lower thermal conductivity and resistivity without adversely effecting one another. Additionally, we will briefly review select heritage (i.e., SiGe, PbTe, TAGS) and emerging class (i.e., Zintl phases) of thermoelectric materials and the benefits and setback each offers.

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Marva Goodson
Michigan State University

Qualitative, Quantitative, and Visual Analyses: Utilizing a Mixed-Method approach to Assess Egocentric Resource Support Networks

Mixed method research is powerful. Its utility, specifically in network science, holds the potential to highlight the voices of participants (qualitative analysis), predicts the odd of a specific outcomes (quantitative analysis), and strengthen research findings that pertain to the structural characteristics of a network through the use of visual representations. The current study integrates the three methods to examine the supervision-related resource support networks of 41 female probationers. Data on the women's 323 network members suggest that few network members are activated to provide support. Based on women's narratives, participants are in greatest need of transportation, financial, and emotional supervision-related resource support. Mixed effects logistic regression models are presented to demonstrated differing activation of support across the three types of support. Findings suggest that younger offenders are more likely to receive all three types of support and recent offenders are more likely to receive emotional support. Network members who are older, live geographically closer to the participant, and share "very close" relationships with the participants are more likely to provide support. Male network members are more likely to provide financial support and parents and significant others are essential to receiving needed support. The implications of the visual analysis will be discussed.

Darya Owens
Wayne State University

Literacy Repeat Access

Inclusive practices involving students with language delays and children experiencing poverty demands literacy access. Congressional panels have heavily emphasized the need to understand benefits of early learning and it's impact on literacy. However, Kliewer (2008), suggest that panels and organizations are disassociated with the literate lives of young children and their placement in for instance in special education. Kliewer (2008) writes, "the struggle is compounded by an array of professional dispositions that conspire to maintain the child outside the literate realm." (p. 104) My methods of repeat reading for equitable experiences involve music, short stories and rhythm activities for repeat access to literacy. Furthermore, coaching of this method will continue as decisions relative to Judge Stephen J. Murphy III 2018 decision states that "access to literacy" is not a fundamental right. He also stated that the lawsuit failed to show that Michigan practiced overt racial discrimination. He, however, agreed that giving students the opportunity to learn to read was "of incalculable importance," but only to become a productive citizen who votes. Kliewer, C. (2008). Joining the literacy flow: Fostering symbol and written language learning in young children with significant developmental disabilities through four currents of literacy. *Research and Practice for Persons with Severe Disabilities*, 33(3), 103-121.

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 underlying these changes in VTA DA structure and function. However, large-scale gene expression studies have been limited to homogenization of the entire VTA, which includes both GABAergic and dopaminergic neurons, potentially obscuring changes that occur specifically in VTA DA neurons. We sought to address this knowledge gap through the use of using Translating Ribosome Affinity Purification (TRAP) to extract actively translating mRNA specifically from VTA DA cells. Specifically, we crossed L10-EGFP mice with DA Cre driver lines (DAT- or TH-Cre) to label RNA in DA cells and then subcutaneously implanted mice with sham or morphine pellets. We confirmed that our samples were enriched for DA transcripts (TH, DAT) and depleted of GABA transcripts (vGAT, GAD) via RT-PCR. We next performed RNA sequencing analysis. Excitingly, we identified a number of genes whose expression specifically in VTA DA cells, or in the VTA as a whole, were significantly impacted by morphine administration. We are now validating candidate gene changes via RT-PCR, and plan to interrogate the functional impact of gene changes in future studies. Thus, the overall goal of this work is to define the changes in the VTA DA transcriptome induced by morphine in order to identify novel therapeutic targets for treatment of addiction.

Anabel Flores
University of Michigan

Mutations in the PH Domain of SH2B1 Result in Energy Imbalance and/or Impaired Glucose Metabolism

Mutations in the scaffold protein SH2B1 have been identified in individuals with severe early-onset childhood obesity, insulin resistance, and hyperphagia. This phenotype is also seen in mice lacking SH2B1 (SH2B1-KO mice). Three of these mutations, including the P322S mutation, are located in the pleckstrin homology (PH) domain of SH2B1, suggesting that the PH domain is important for the overall function of SH2B1. To gain insight into how SH2B1 regulates energy balance and the function of the PH domain in SH2B1, we used CRISPR-Cas9 to make a mouse model containing the human P322S obesity-associated mutation. We also obtained a mouse with an indel that produced a two-amino acid deletion (Δ P317, R318) in the PH domain. Similar to the SH2B1-KO mice, the Δ P317, R318 mice show significantly increased body weight, decreased glucose tolerance, decreased insulin sensitivity, increased plasma insulin levels, and increased adiposity. Despite their greater weight, female Δ P317, R318 mice do not show increased food intake and males show only modest increased food intake. Thus, their increased body weight is likely to be due at least in part to decreased energy expenditure (ongoing experiments). At the cellular level, the Δ P317, R318 deletion changes the localization of SH2B1 from being primarily in the cytoplasm and plasma membrane to being primarily in the nucleus. This suggests that the PH domain may be a key regulator of SH2B1 subcellular localization, which in turn affects the ability of SH2B1 to regulate energy and glucose homeostasis.

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Brittney Nichole Moore
Northern Michigan University

Immunohistochemical Analysis of Basigin and Axl Expression in Glioblastoma

Glioblastoma (GBM) tumors are a type of brain cancer with few effective treatment options. The median survival time of patients who receive the standard care of surgical resection, radiation, and chemotherapy is little more than a year. Therefore, the identification of new potential cancer biomarkers is vital to developing targeted therapies for GBM patients. Current biomarkers in GBM include the proteins Isocitrate dehydrogenase 1 (IDH1), Telomerase (TERT), tumor protein 53 (TP53), and ATP-dependent helicase ATRX (ATRX). While these biomarkers are useful in characterizing the GBM tumor, therapies targeting these molecules have not been effective. Receptor tyrosine kinase (RTK) inhibitors are currently undergoing clinical trials for various cancers such as non-small lung cell carcinoma, as many RTKs are overexpressed in various cancers. Evaluating these potential therapies for GBM is important as many RTKs are also overexpressed in GBM. The protein called Axl is a RTK that is highly expressed in GBM. Axl is involved in epithelial to mesenchymal transition (EMT), which is a process that underlies cancer metastasis. The protein called Basigin is a transmembrane glycoprotein that stimulates matrix metalloproteinase (MMP) expression leading to the degradation of the extracellular matrix (ECM) that surrounds the tumor. This action facilitates tumor invasion by degrading physical barriers to proliferation. Basigin has previously been demonstrated to be overexpressed in GBM by immunohistochemistry assay. Little work has been done to characterize Axl expression in lower grade brain tumors such as astrocytomas. As the expression of Axl and Basigin individually correlate with a more aggressive phenotype of tumors, we propose that the expression of Axl and Basigin are directly correlated in astrocytic tumors.

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Daniel Babayode
Michigan State University

Electrochemical Detection of Salicylic Acid in the Brain

Electrode fouling is an issue that occurs when attempting to identify salicylic acid electrochemically. This problem is serious due to the positive impact salicylic acid can have upon the body, such as preventing cancers, and diminishing the effects of neurodegenerative diseases. Electrode fouling due to adsorbed reaction product(s) occurs on sp²-bonded carbon electrodes, like glassy carbon. In this research project, we sought to answer the question, does electrode fouling occur on sp³-bonded carbon electrodes, like boron-doped diamond? Cyclic voltammetry was used with solutions of salicylic acid in 0.1 M phosphate buffer, pH 7.2. This electrochemical method was used to determine the oxidation peak potential, Epox, and the oxidation peak current, ipox, as a function of the salicylic acid concentration (1-1000 μM), scan rate (50-500 mV/s), and scan number at a given scan rate. In addition to studying the oxidation reaction at boron-doped diamond thin film electrodes, measurements were also made at nitrogen-incorporated tetrahedral amorphous carbon thin-film electrodes. It is hypothesized that a stable and sensitive oxidation response will be observed at both diamond and tetrahedral amorphous carbon electrodes with no surface fouling.

Daniel Vega
St. Olaf College

A Human Rights-Based Approach to Latinx Organizations

Since immigrating into the U.S in the 1900's, Latinos have established a strong community that often advocates and fights for rights of individuals. Latinos and many within the community have banded together to create organizations that allow them to continue to advocate and protect the rights of their community. However, not every community is able to enjoy rights to their fullest extent, and Latino community organizations, and individuals are doing their best to obtain these rights for all. A two-hour survey-interview was conducted with a small sample size of Latino organizations to understand the kind of work they are focusing on. For analysis, we draw upon a "human rights-based approach (HRBA), (Aaronson & Zimmerman 2006). These five human rights: rights to a sustainable livelihood, rights to essential social services, personal liberty rights, political and social rights (rights to be heard), and identity rights. These rights are essential for humans to lead a successful, happy, and safe lives. Preliminary findings suggest that much of the work done by Latino organizations is related to the five human based rights. Also, it was found that some organizations have their specialty in one area, yet they continue to participate within the other rights. This suggests that each organization has discovered multiple problems within the community, therefore, is attempting to work on many of these issues simultaneously. Even without explicit coalitions and links, Latino organizations in our study are complex, dynamic, multi-dimensional, and inter-connected. Further, findings also suggest that 'rights' are not singular but intersecting and overlapping, reflecting the multiplicities of oppression and injustices that people face. With However, because of the lack of resources, they're able to do what they can, but they can't fix all of the problems.

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Davina Patrice Spears
Michigan State University

Synthesis from Glucose Toward Nylon 6

Research in the field of green energy and green organic chemistry has taken many routes, including using the world's surplus of biomass into fuels and chemicals. The goal of this research is to develop a method of synthesis to convert cellulose into caprolactam, a precursor to Nylon-6. Such an intended process is going to take an advantage of 6-carbon atom chain already present in glucose, to convert it into a 6-member carbon chain in Nylon 6 fragments. In the overall process we envision, we are going to hydrolyze cellulose into glucose, aminate glucose and adjust its oxidation state to end up with the 7 membered ring of caprolactam, or a Nylon precursor with a similar molecular structure. In our current studies, we have been looking into attachment of a nitrogen atom to the first carbon on glucose molecule. The best results have been achieved by reacting glucose with p-toluenesulfonamide in the presence of ethylene glycol. The resulting glycosyltosylamide was characterized using ¹H NMR and ¹³C NMR in D₂O, which demonstrated its formation.

Devan Nicole Keys
Wayne State University

What Rocked the Cradle: An Investigation of the Effects of Childhood Trauma on the Biobehavioral Risk of Expectant Mothers and Fathers

Studies have found that trauma and maltreatment experienced during childhood can impact a parent's parenting practices. However, most literature on the topic discusses the negative outcomes of childhood trauma and how it impairs a parent's ability to be resilient while parenting. This poster draws on preliminary data from the current study to examine how biobehavioral data can explain resiliency and risks, and how this biobehavioral data can be directly affected by a parent's history of childhood trauma. This study aims to encourage clinicians to create coping mechanisms and therapy methods to buffer against its negative effects.

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Diandra Straiton
Michigan State University

The Relationship Between Family-Centered Care and Behavior Analysts' Use of Parent \ Training for Children with ASD

Parent training (PT) is an evidence-based intervention in which clinicians teach parents strategies to help their child to acquire skills and decrease challenging behavior. Little is known about the relationship between providers' use of PT for children with autism spectrum disorder (ASD) and family-centered care (FCC), which is the degree to which providers collaboratively make healthcare decisions with families. Survey responses from 1,415 behavior analysts were utilized to examine behavior analysts' a) self-reported frequency of evidence-based PT strategies, and b) degree of FCC. On average, behavior analysts reported moderate-to-high frequency of use for all PT strategies, with average frequency ratings ranging from 3.02 to 4.24 out of a 5-point Likert scale. FCC was significantly associated with overall frequency of PT strategy use ($r = .47, p < .001$), average length of PT sessions ($r_s = .17, p < .001$), average number of PT sessions per month ($r_s = .25, p < .001$), and average duration of PT as an intervention used over the course of treatment ($r_s = .10, p = .001$). Additionally, providers that reported having at least one pre-service training experience related to PT were significantly more likely to have higher degrees of FCC, $t(1156) = 3.04, p = .002$, suggesting that pre-service training experiences related to PT may help increase behavior analysts' degree of FCC and subsequent use of PT strategies.

Eva Nyutu

Western Michigan University

Students' Affective Experiences in Undergraduate Science Laboratories

Student attitudes and perceptions are essential components of classroom interactions and learning. How students feel may determine the level of commitment to their coursework. For example, if a student does not like biology (attitude) this can lead to a subsequent avoidance of biology (behavior). Ornstein (2006) states that "how well students perform in academic science courses, over the long run, is not as important as their understanding of broad science concepts and their attitudes toward science. It is of great importance that educational systems recognize the pivotal role played by student attitudes and seek actions that will promote positive attitudes towards science." Researchers claim that when students participate in science laboratories they develop positive attitudes towards science. Researchers also claim that if students have high mean scores on any of the five dimensions of the Science Laboratory Environment Inventory (SLEI) then they have positive attitudes toward the science.

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Gayle Melissa Shipp
Michigan State University

Factors Associated with Fruit and Vegetable Purchases of SNAP Recipients Residing in Multi-person Households within a Food Desert

Fruit and vegetable (F&V) intake is associated with obesity, which is disproportionately high in urban food deserts and low-income populations, including Supplemental Nutrition Assistance Program (SNAP) participants. This cross sectional study sought to examine factors associated with food desert SNAP recipients' F&V purchases and weight status in multi-person households. Socio-demographic characteristics, access to healthy foods and stores, affordability, purchasing practices, use of food assistance and weight status were analyzed. A convenience sample of seventy-one SNAP recipients were recruited from a Detroit, MI food desert. Participants were 45-54 years of age (33.8%), average BMI = 30.33. Multiple linear regression determined if socio-demographic and household factors were associated with fruits and vegetable purchases and BMI. Results showed that those who were more likely to limit F&V purchases were not getting enough food to eat ($p=0.009$), and males who indicated limited finances ($p=0.043$). BMI was negatively associated with participants not getting enough food to eat within the household ($p=.04$). SNAP recipients, living in food deserts can benefit from public health interventions, policies and education that can influence F&V purchases and likely consumption.

Jacob Dean Russell
Western Michigan University

Qualification Test Planning for the Western Michigan University Plasma Spectroscopy CubeSat

Testing a satellite on the ground involves predicting the physical conditions that the spacecraft will withstand during launch and on orbit. The objective of this project is to develop a plan for qualification testing for a CubeSat in development at Western Michigan University based on information from guidelines, databases, and research papers from the small-satellite sector. The current mission of Western Michigan University's CubeSat Program, the Western Aerospace Launch Initiative (WALI), is to build a nanosatellite to demonstrate health diagnostics of an electric propulsion system using optical emission spectroscopy. The WALI CubeSat will contain two payloads: a cathode plasma-generating device and an optical emission spectrometer. In this project, a pre-launch test plan was developed for the CubeSat. The test plan includes vibrational/shock testing for mechanical safety during launch and thermal/vacuum testing to determine the satellite's viability on orbit. The goal of the test plan is to meet typical ride-share launch qualification testing requirements and to verify that the spacecraft will operate successfully in the space environment.

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Josue Salas
Wayne State University

Cat's Cradle as Vonnegut's Anti-Parable

Kurt Vonnegut's novel *Cat's Cradle*, published in 1963, possesses many characteristics of the standard parable. However, although the novel examines various aspects of human morality the most significant difference between *Cat's Cradle* and the standard parable might be the standard parable's most essential quality, that being the parable's moral. While most well-known parables such as those found in *The Bible* provide morals that even young children can understand, *Cat's Cradle* does not. *Cat's Cradle's* moral, just like a real game of *Cat's Cradle*, becomes more complicated as one continuously moves from line to line, be it a line of text or a line of string. Thus, *Cat's Cradle* is not a parable but an anti-parable, where Vonnegut does not provide the reader with an explicit moral, with the purpose of forcing the reader into an exercise of self-reflection, where they must construct their own moral from the text. This study asserts that Vonnegut's moral is a critique of the idea of a moral, or in other words, it is an anti-parable.

Justin Cassab
Michigan State University

Using Linguistic Inquiry and Word Count (LIWC) Software to Examine trends in Employee's Organizational Culture Coded Feedback

Organizations often collect a significant amount of text data from their employees. However, little research in identifying efficient strategies to mine text data exists. Natural language processing (NLP) is a promising method for analyzing qualitative data. The study at hand sought to analyze qualitative employee feedback comments obtained from a single anonymous organization. Employee comments were coded by raters on whether they discussed the organization's culture or not (1=yes, 0=no). Culture coded comments were then ran in the "LIWC" program, a validated NLP program that classifies and analyzes text data on multiple psychological dimensions. An ANOVA was conducted to test mean differences between culture coded comments (N=21) vs. those not (N=120) on these dimensions. Significant differences ($p < .05$) between groups were found in the dimensions of "anger" and "focus present." Anger signifies language that holds an angry tone like "Hate" or "Kill", while focus present is language that represents present time like "Today" or "Now". Significant differences were also found at the $p < .1$ level for "negate." Results suggest that comments coded as culture were higher on 'anger,' 'present focus,' and 'negate' language compared to other comments. Implications of these results are that organizations may use text data to identify pertinent issues by analyzing the language used by their employees. Qualitative employee data may help organizations identify trends in employee retention rates or gain a better understanding of employee's morale above survey data alone. Future directions include the use of machine learning to better identify and categorize themes present in qualitative data.

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Kalani Gates
Western Michigan University

Preventing Sexual Victimization: An Assertiveness Training Program for Female Adolescents

Sexual victimization, defined as unwanted physical contact through the use of coercion, harm, or threats, is a pervasive issue amongst adolescents ages 12 to 17 (Lacasse & Mendelson, 2007; Planty, Langton, Krebs, Berzofsky, & Smiley-McDonald, 2013). Assertiveness skills have shown to be protective factors against sexual victimization (Brecklin & Ullman, 2005; Weitlauf, Smith, & Cervone, 2000). The frequency of peer-perpetrated unwanted sexual encounters is higher during adolescence; however, past research on sexual assault prevention focuses on college age women (Planty et al., 2013). This study focused on the prevention of unwanted sexual experiences amongst female adolescents by implementing an assertiveness training program. The program utilized a behavior skills training model (e.g., instructions, modeling, frequent feedback, and rehearsal) and focused on teaching assertiveness skills (e.g., eye contact, volume of voice, and congruency of verbal and physical expression) within the context of coercive interpersonal interactions. To assess their assertiveness skills, observational data was collected through 1:1 video role-plays. This study examined the effectiveness of an assertiveness training program with the aim of reducing the likelihood of unwanted sexual experiences among adolescent females. Results and implications of the study will be discussed.

Lila Afifi
Michigan State University

*A Case Study in Hyena (*Crocuta crocuta*) Lineage and Paternity*

Spotted hyenas (*Crocuta crocuta*) live in complex, matriarchal societies called clans. Maternity can be determined based on nursing behavior. However, genetic methods are necessary to determine paternity and to track the overall relatedness within a clan. Relatedness has important implications in behaviors such as cooperation and nepotism. Here, we examined the role of paternity within a single lineage over time. Our first hypothesis was that higher ranking females will select higher ranking males and that lower ranking females will select lower ranking males. Our second hypothesis was that once a female selects a mate, the female will repeatedly mate with the same male over the course of his tenure. As a case study, we focused on one prolific male from the Mara Hyena Project's long-term study clan in southwestern Kenya. DNA was extracted from fecal and blood samples. Twelve microsatellite loci were used to assign paternity with the assistance of the program, Cervus. Our analyses examined the effects of rank and male tenure on the continuity of paternity within a single matriline. The findings will lay the foundation for more comprehensive paternity analyses and contribute to deepening our understanding of the effects of relatedness on behavior.

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Pero E. Dagbovie
Michigan State University

Is There Evidence Of A 'Ferguson Effect' On Crime In The United States?

Following the killing of Michael Brown in Ferguson, Missouri and the ensuing chaos, social commentators introduced the idea of the “Ferguson Effect.” This effect claimed that the increased public scrutiny of police officers following police shootings results in higher crime rates. Although some past work has attempted to study this effect, past efforts have been limited to one or two cities and have had problems with measurement of crime rates. The current research tests for evidence of one model for the Ferguson Effect: that the increased scrutiny of police officers’ dealings with black communities causes officers to disengage from discretionary policing methods and, as a result, crime rate increases. I will test whether changes in national discretionary policing data have corresponded to changes in national crime rates. The two major strengths of this work are (1) the use of over-time data across a large number of U.S. cities, and (2) a measure of crime that is independent of policing data (death by assault data from the CDC).

Ramon Diaz
Michigan State University

Increasing the Area of Single Crystal Diamond Plates Grown by a Combination of Mosaic Technique and Lateral Growth

The electrical, mechanical, and thermal properties of diamond make it a promising material for new generation electronic devices. One of the challenges in developing diamond-based components is the need for fabricating larger size Single Crystal Diamond (SCD) wafers with minimal defects. In this study, we propose a series of steps to improve the mosaic technique, where large area SCD plates are grown based on a substrate where at least two separate seeds are placed together and aligned under optimized conditions. Homoepitaxially grown diamond layers are deposited over this substrate via MPACVD (Microwave Plasma-Assisted Chemical Vapor Deposition) using a system configuration known to enhance lateral growth. Preliminary experiments have demonstrated the feasibility of the developed process where crystallographic orientation of this substrate was improved, resulting in successful merging of the mosaic plates, and subsequent reduction of defects generated at the interface. The initial diamond tiles are polished and kept in contact by aligning their base with a polycrystalline diamond plate used as reference on the sample holder during growth. The grown sample was re-polished and re-grown multiple times until the contact interface (stitched region) disappeared, effectively merging the tiles back into a larger single crystal. Defect densities from the grown layers were analyzed by etch pit counting and birefringence measurements. X-ray rocking curve mapping of the sample shows a maximum misorientation spread of 0.2 degrees, with an average mosaicity of 0.019 ± 0.008 degrees along the surface.

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Serena Simpson
Michigan State University

Reconstruction of the Neuronal SNARE Complex in vitro

Neurotransmission is a critical process for multicellular organism communication. This process involves several post-synaptic receptors and begins with the fusion of synaptic vesicles and plasma membranes at the pre-synaptic terminal. The proteinaceous complex that facilitates the fusion event is known as SNARE (Soluble NSF Attachment Protein REceptors). Inhibition of the SNARE abolishes neurotransmitter release and is a determinant in diseases such as Parkinson's and schizophrenia. The SNARE core contains three different proteins: syntaxin (Stx), synaptobrevin (Sb), SNAP-25 (S25) that employ two chaperone proteins: munc-18 (M18) and munc-13 (M13). Collaboratively, Stx, Sb and S25 undergo a zipper mechanism whose proper conformation is ensured by M18 and M13. However, limited structural and functional data of this transitional complex currently exist. In order to address this shortcoming, we reconstructed the pre-docked SNARE in vitro. Soluble Stx, Sb, S25 and a linked version of M18 and M13 (M18-M13) were purified through chromatographic methods and reconstitution was attempted at specific pH and salt concentrations. Immuno-decorations suggest that S25 has higher affinity for the tripartite complex (M13-M18:Stx) than Sb. These data set the stage for efficient SNARE reconstructions that will assist in the expansion of structural knowledge of the SNARE complex through cryo-electron microscopy and x-ray crystallography.

Solidad Nwakibu
Spelman College

Individual and Social Motivation in Bombus impatiens Foraging

There is ample research on how social bees respond to changes in the quality of a food source, increasing intake when food gets better and decreasing intake when food gets worse. Less well studied is how intake may change when food quality stays constant. Bumble bees (*Bombus impatiens*) often show patterns of habituation to food of constant quality: seeming to lose interest in it after repeated visits. This resembles how solitary animals stop feeding when they are satiated, but the process in bumble bees is expressed on the social level, raising the question of what social, behavioral, and neural process underlie it. It is also a problem of economic importance because plant growers who use bumble bees for pollination often complain about the lack of motivation for the bees to forage on plants. This is part of a larger study that investigates the factors that influence habituation to food. The larger study will examine colony food and pharmacological influences on motivation. This study focuses the concentration of the food, and specifically asks how motivation changes for low quality food versus high quality food. Either of these might lead to improved management practices to ensure high motivation for pollinators used in agriculture.

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Tasia Bryson
Western Michigan University

*The Impact of Advisor Mentoring Styles on Black Female
Advisees at Predominantly White Institutions*

Relationships play an important role in the doctoral students' life. (Nakamura et al., 2009). Specifically, advisors are often the central and most powerful person influencing a student's trajectory through graduate school (Barnes & Austin, 2009). This study will explore how advisor and advisee mentoring relationships impact underrepresented minority students' experiences in science graduate programs. Mentor-Protégé Fit is a conceptual framework used to understand the impact of the advisor-advisee relationships from the students' perspective. Afrocentric framework will also be used to focus on the African American experience through the approach of an African-American-inspired ideology that manifests an affirmation of them in a Eurocentric-dominated society. Using a qualitative research approach, data was collected through semi-structured interviews and analyzed with emergent coding. The research sites for the study were predominately White institutions in the Midwest. Purposeful sample method was used to identify four Black females in science graduate programs. Findings from this study can help inform advisors as they navigate mentoring relationships with Black women advisees at predominately White institutions.

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Tatiana Bustos
Michigan State University

Evidence-Based Intervention Sustainment Strategies in Public Health: A Systematic Review

Sustainability of evidence-based interventions (EBIs) is an ongoing challenge in public health. Many public health interventions are often adapted or modified for sustainment in complex, real-world settings. However, sustainment as a concept is not explicitly defined and the strategies followed to ensure sustainment of evidence-based interventions are underreported. A systematic review was conducted to summarize existing evidence around sustainment of EBIs and presentation of sustainment efforts in public health literature. We searched PsychInfo, Embase, Proquest, PubMed and Google Scholar from February to March 2017. Eligibility criteria included: EBIs in public health, conducted in community-based settings and reported outcomes related to sustainment of EBIs. Details characterizing the study setting, design, target population, and type of EBI sustained were extracted. Quality of the studies was evaluated with a quality assessment criteria. Twenty-three articles published from 2004-2017 were found eligible. The majority (n=17) of studies were conducted in high-income countries. Studies from low-income countries were mostly cross-sectional, but all longitudinal studies were carried out in high-income countries. Although the importance of sustainability was acknowledged across all studies, the concept was inadequately defined with only seven studies presenting a definition of sustainability in the text. Six of the studies reported sustainment efforts, and three studies reported activities related to sustainment by referencing a sustainment framework. Studies reporting sustainment related outcomes can benefit from a more explicit definition of the concept. Better reporting of steps followed, frameworks used, and adaptations made to sustain the EBI can contribute to a more standardized concept of sustainability.

Ted Roper
Northern Michigan University

Pollination-Induced Floral Senescence in Calopogon tuberosus

Pollination ecology is a dynamic and rapidly growing field of study with major implications for plants, animals, ecosystems, and ecological communities across the globe. *Calopogon tuberosus*, commonly called the Tuberous Grass-pink orchid, is one of the most abundant and widespread orchids in North America, yet relatively little is known about its pollination ecology. Finding a lack of information in the primary literature, we looked at several aspects of the pollination ecology of *C. tuberosus*, with particular focus on whether the flowers close and senesce prematurely in response to pollination. With pollinators declining across the globe and weather patterns rapidly changing, understanding more about the pollination of *C. tuberosus* will be essential in the conservation and monitoring of this unique species. To test our predictions, we chose two field sites with floating bog mats near Marquette, MI. At each site, 40 plants were monitored daily; 10 plants in each site were covered with fitted mesh cages to exclude pollinators. In addition, 20 flowers were hand-pollinated the first day they opened. Each flower's opening and closing dates were recorded, along with the height of each flower and whether or not seed capsules developed (to confirm pollination). Our results showed a significant difference between the mean days open for hand-pollinated versus enclosure flowers ($p < 0.001$), for hand-pollinated versus open-unpollinated flowers ($p = 0.01$), and for enclosure versus open-pollinated flowers ($p < 0.001$). Our study will help close the gap in the literature on *C. tuberosus* and will be informative for future research and conservation efforts.

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Victor Ruiz-Divas
Michigan State University

Educational Segregation in 2018: How Racially Restrictive Covenants and Redlining are Still Impacting Students in Urban Public Schools

K-12 urban students throughout the United States still continue to be impacted by various forms of educational segregation. Educational segregation, with roots in the Jim Crow era, continues to impact students based on the geographical location of urban schools. As a result, there are many schools in urban communities that are suffering from poor funding, lack of highly-certified educators, lack of resources, and more, all because of where that school is located. This project addresses the issue of educational inequality between public schools in urban and suburban areas located in Grand Rapids, Michigan. Specifically, this project primarily focuses on addressing the differences in school funding and how this has an impact on the quality of education students receive and the quality of learning experienced in the classroom. The goal of this research is to investigate methods on how to improve the education and quality of learning for students enrolled in urban public schools not only in Grand Rapids, MI but nationwide. For this project, a literature review of both refereed research and mainstream news studies/articles was conducted as well as data collection from four data bases. Nine schools in total were observed for this project. The schools are from the Grand Rapids Public Schools and East Grand Rapids Public School districts. The group consisted of elementary, middle, and high schools. Six schools are majority-minority schools and three are predominately white. Information on student and teacher demographics, school discipline, school funding per pupil, teacher salaries, and courses offered were looked at for all observed schools and all mentioned information was obtained from the U.S. Office of Civil Rights Data Collection (CRDC). Test-scores and student performances in Mathematics and Science were obtained from the National Assessment of Educational Progress (NAEP). Data on average local and surrounding household incomes were obtained from the City-Data website. Michigan schools' average ACT/SAT test scores were obtained from the MI Schools website. Data obtained from the four databases show clear and distinct differences between schools in GRPS and EGRPS. Differences include school funding, quality of education, and student academic performances. These differences can be traced back to the racial practices of restrictive covenants and redlining that occurred in the eras of 1920-1948 and 1934-1968 (respectively). This along with modern discriminatory practices contributes to the low funding urban schools receive and the low reputation of these schools. The latter having a negative impact on the academic performances of students which also contributes to the low funding and reputation of the school. Two methods to improve this situation would be to focus more on literacy in key subjects such as mathematics and science and to implement a more student-centered way of instruction. These can increase the understanding of crucial information in these subjects which can improve the academic performances of the students. The latter having a positive impact on the schools reputation and later on, the school funding.

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What is Michigan AGEP Alliance (MAA)?



The Michigan Alliance for Graduate Education and the Professoriate (AGEP) seeks to join together universities and colleges in the common mission of increasing the number of underrepresented minority students earning PhDs and positioning minority students to become leaders in the social, behavioral, and economic sciences fields (SBE), science, technology, engineering and mathematics (STEM) fields.

Each AGEP alliance employs creative administrative strategies, develops infrastructure, and engages in substantive partnerships with non-doctoral granting institutions (many minority-serving institutions to enhance recruitment, retention, and advancement).

Five major research universities in this alliance include the graduate schools at the University of Michigan, Michigan State University, Michigan Technological University, Wayne State University, and Western Michigan University.

For more information, visit us at:

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