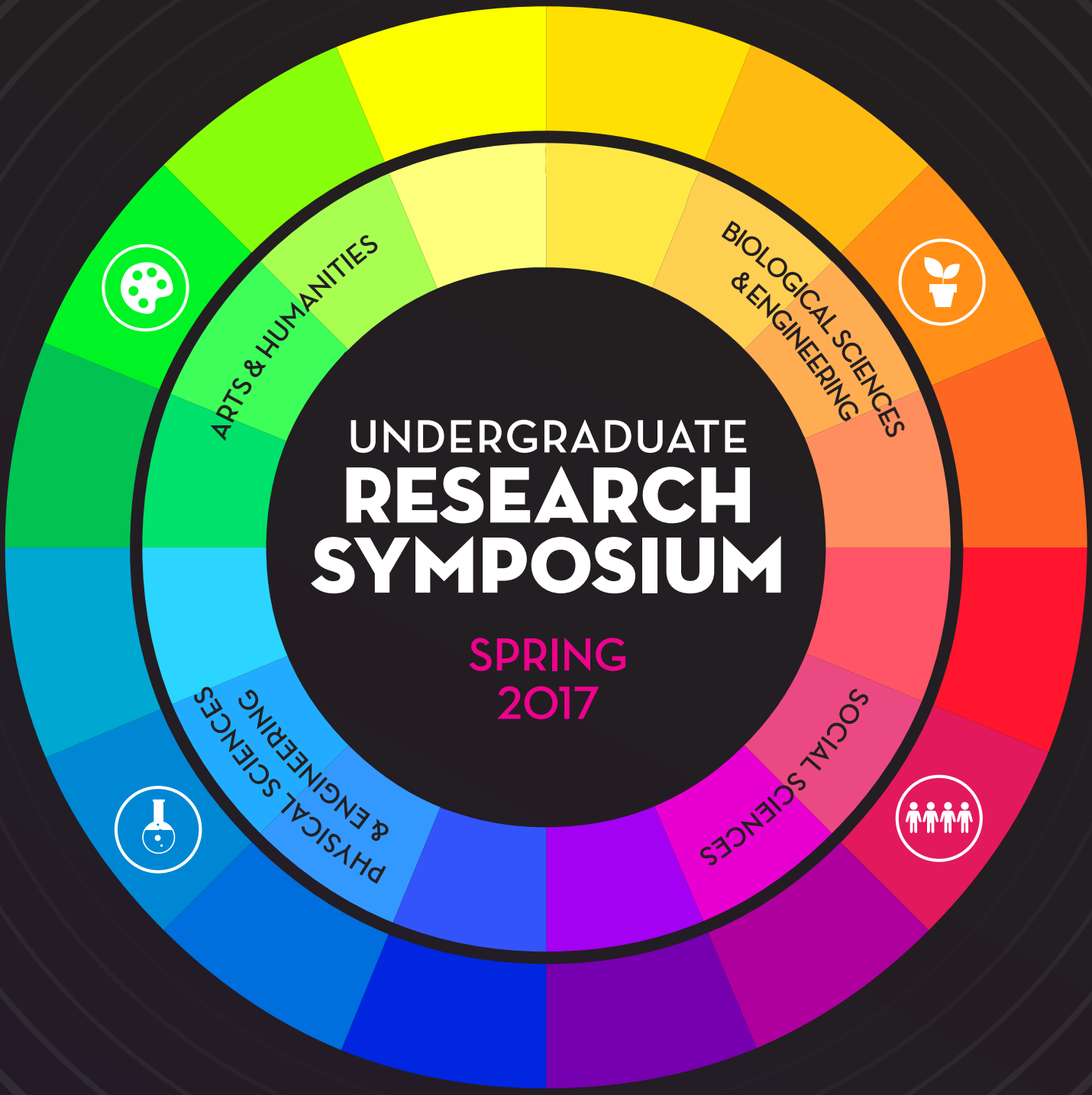


UNDERGRADUATE RESEARCH SYMPOSIUM

SPRING 2017

THURSDAY

APRIL 13, 2017

GRIFFIS HALL

MISSISSIPPI STATE UNIVERSITY

JUDY AND BOBBY SHACKOULS HONORS COLLEGE

MISSISSIPPI STATE UNIVERSITY™
JUDY AND BOBBY SHACKOULS
HONORS COLLEGE

WELCOME

The Shackouls Honors College is pleased to sponsor the spring 2017 Mississippi State University Undergraduate Research Symposium. Prizes for academic areas are being partially supported by Phi Kappa Phi. The Shackouls Honors College has provided summer research support to some of the students presenting with additional funding from the Mississippi State University Office of Research and The National Strategic Planning & Analysis Research Center (nSPARC).

In recognition of Mississippi State University's Carnegie Community Engagement Classification, the Undergraduate Research Symposium is pleased to be continuing to include Community Engagement track in the symposium. We also have new competitions in Public Health Research sponsored by the Department of Food Science, Nutrition, and Health Promotion and the Thesis Research Competition, sponsored by the Graduate School.

We view the encouragement and support of undergraduate research for all students to be part of our core mission. Just as a good liberal education broadens the mind, provides students with a common core of knowledge, and familiarizes them with the basic methodologies of the various academic disciplines, undergraduate research allows students to dive deeply into important ideas and topics in a rigorous and creative way, paving the way for future intellectual work and exploration whether in the academy, business, or other life arena. Enjoy the student posters and presentations and come away knowing more than when you entered our doors.

Dr. Seth F. Oppenheimer
Professor of Mathematics
Director of Undergraduate Research
Shackouls Honors College

MISSISSIPPI STATE UNIVERSITY™

Mississippi State University: Our State's Land-Grant Research Flagship

We are honored to welcome you to Mississippi State University's 2017 Undergraduate Research Symposium. Undergraduate students are an integral part of the multi-faceted research underway at Mississippi State.

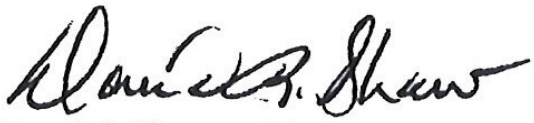
Every day, our faculty, staff, and students are conducting fundamental to applied research that provide innovative solutions, creative works, and new scholarship that address pressing local, state, regional, national, and global needs.

As a result of this work, MSU is the flagship institution in our state for research that falls within its land-grant mission. Strengths across all colleges and research centers have led to our institution being categorized by the Carnegie Foundation as a "high research activity" institution. The Carnegie Foundation has also recognized Mississippi State with its Community Engagement Classification.

Pursuing research opportunities is a critical part of academic life on our campus, and our students are recognized for their commitment to discovery, creation, and exploration in our labs, studios, library, research farms, and beyond. We are pleased that members of our faculty are committed to providing undergraduates with meaningful roles in the overall research enterprise, and promoting interdisciplinary research as an important component of scholarly activity.

Undergraduate research gives our students opportunities to apply classroom knowledge to new areas of interest, and helps them develop skills, collaborate with faculty and peers, and gain confidence. It is exciting to see the results of their efforts on display at today's symposium.

Again, welcome to the symposium, and thank you for your contributions to and interest in research at Mississippi State University.



David R. Shaw, Ph.D.
Vice President for Research and Economic Development

MISSISSIPPI STATE UNIVERSITY™
CENTER FOR COMMUNITY-ENGAGED LEARNING

The 19th Century philosopher Herbert Spencer said, "The great aim of education is not knowledge but action." Students participating in community-engaged research, learning, or service live the great aim of education by creating scholarship, improving communities, and gaining a better understanding of their role in the world. On behalf of the Center for Community-Engaged Learning, I commend the students and faculty mentors for their community-engaged research and scholarship. The Community Engagement Track of the Undergraduate Research Symposium highlights these efforts and celebrates the work accomplished through Mississippi State's partnerships with external collaborators.

Congratulations on your outstanding accomplishments! We look forward to continuing to work with you transforming knowledge into action that drives meaningful change.

M. Cade Smith

Dr. M. Cade Smith
Director
Center for Community-Engaged Learning

THE HONOR SOCIETY OF
PHI KAPPA PHI

The Honor Society of Phi Kappa Phi (PKP) has a long and distinguished history. Currently, there are over 300 chapters of PKP scattered all across the world, from Maine to Hawaii and the Philippines, and from Alaska to Puerto Rico and beyond. During the 1996-97 academic year, PKP celebrated the 100th anniversary of the founding of The Honor Society of Phi Kappa Phi, and we are now in the second century of its recognition of - and service to - learning. The MSU chapter is in its 66th year of membership. Due to PKP's prestigious recognition and support of learning, the MSU Chapter is proud to also financially support the Spring 2017 Undergraduate Research Symposium in Griffis Hall at Mississippi State University. As President, I am honored that Phi Kappa Phi has been asked and is able to support this event as I have tremendous respect for undergraduate research at MSU. This symposium displays that research at its best!

Thanks,
Dr. Dave Dampier, President

In Mississippi and the nation, public health research can have a dramatic impact on improving health and quality of life. At Mississippi State University, faculty, staff, and students in fields from biology to landscape architecture are making valuable contributions to public health. In celebration of National Public Health Week 2017, we are pleased to sponsor the first annual Public Health Research Competition to recognize outstanding student research in a public health-related field.

We recognize and commend the student scholars and faculty mentors who dedicate their time to public health research, and we thank the sponsors who have made this competition possible: the MSU Department of Food Science, Nutrition and Health Promotion, the MSU Department of Communication, the MSU Department of Sociology, the Mississippi Public Health Association, and the Myrlie Evers-Williams Institute for the Elimination of Health Disparities.

Congratulations on your achievements!

Brittney D. Oliver, PhD, CHES
Assistant Professor of Health Promotion
Department of Food Science, Nutrition and Health Promotion
Chair, MSU National Public Health Week Committee

Theta Tau Professional Engineering Fraternity is a co-ed organization that promotes service, professional development, and brotherhood. Our 57 active members are a diverse group from every major in the Bagley College of Engineering. We strive to become the engineering leaders of the future and are excited to support an individual in this year's research symposium to receive the *TomorrowBuilder Award.* We want to recognize an engineering undergraduate student who uses their skills and discipline to solve complex problems of critical importance to our planet and help to advance our society.

MISSISSIPPI STATE UNIVERSITY™
THE GRADUATE SCHOOL

I commend each of you on your accomplishments. You have shown a commitment to research and creative discovery in your respective fields of study, an achievement worth recognition. As researchers you are gaining valuable experience, whether it be theoretical or experimental, and you are helping to expand the body of knowledge in your field. These are experiences can provide glimpses into the world of post-baccalaureate studies and can be crucial when it comes time to apply for admission to graduate school. I hope that when the time comes you will consider continuing your studies here at Mississippi State University. I can say with confidence your work is being noticed. You should all be very proud of what you have accomplished thus far in your academic careers.

Best,

Lori Mann Bruce

Lori Mann Bruce, Ph.D.
Giles Distinguished Professor of Electrical & Computer Engineering
Associate Vice President and Dean of the Graduate School
Mississippi State University

Spring 2017 Undergraduate Research Symposium Schedule

Poster Session: Griffis Hall (1st, 2nd, 3rd, and 4th Floors)

1:00 pm - 3:30 pm

Arts and Humanities Concurrent Talks: Room 401

These are 10 minute talks. One or two questions are allowed but time needs to be left for the next speaker to set up.

1:00 - Zoe Barfoot: *Burn-out Velvet* *****

1:15 - Karmlya Cleggins: *Historic Gown Research*

1:30 - Meredith Hilliard: *Linguistic Violence and Virility: Spanish Language Use and the Linguistic Construction of Power in Junot Díaz's The Brief Wondrous Life of Oscar Wao*

1:45 - **Break**

2:00 - Kelsey Horn: *The Ghostly Presence of Female Voices in Mary Shelley's Frankenstein*

2:15 - Audrey Jarvis: *Revitalizing Economic Growth: A Case Study of Micro, Small and Medium Fashion Enterprises (MSME) in Montgomery and Webster Counties in Mississippi, USA*

2:30 - Georgeann Kenney: *Love vs. Self-loathing through letters in Frankenstein*

2:45 - Jill McNeece: *The Carnival Square: The Battlefield*

Thesis Research Competition (TRC): Room 407

1:30 - Michael Costa: *Are Banks' Changes In Held-To-Maturity Securities Related to Incoming Capital Requirements?* *****

1:35 - Francesca Wadlington: *Geminate Consonants in Italian: English Speakers' Perception Before and After Training*

1:40 - Jackson Coole: *Computational Modeling Approach Offers Predictions into Mechanistic Properties of AGE/RAGE Signaling Cascade*

1:45 - James Grafe: *Catalpa Creek Suspended Sediments and Water Quality Monitoring*

1:50 - Erin Hartfield: *Microbial Sweet Potato Leather*

1:55 - Ty Faulkner: *Review of Sustainable Practics at Stony Brook Millstone Center*

2:00 - Wellesley Dittmar: *A system to identify gene products that alter airway hyper-responsiveness from -omics datasets*

2:05 - Abigail Long: *A Perfect Storm: A Study of Antisocial and Prosocial Psychopaths*

2:10 - **Break**

***** indicates technology is needed

2:30 - Bianca Quade: *Step aside, Brita: Applications of Biochar in Agricultural Waste Water Remediation*

2:35 - Fleshia Gillon: *Silk Shatter*

2:40 - Jennifer Darce: *Outsmart the Test!*

2:45 - Joshua Bedi: *Immigration and Baumolian Entrepreneurship*

2:50 - Kaitlyn May: *Media multitasking in relation to cognition and sociopsycho well-being: a literature*

2:55 - Bethany Haynes: *Epigenetic Control of Male Fertility through Sperm Histone 4*

3:00 - Whitney Littlejohn: *Study Abroad Autoethnography*

3:05 - Zachary Henry: *Ecological Functionalism in the Work of Glenn Murcutt: A Case Study of the Fredericks-White House*

3:45 pm: Award Ceremony - 4th Floor Forum, Room 401

Moderator: Dr. Seth F. Oppenheimer

Featured speaker: Dr. Marion Evans, Professor and Head, Department of Food Science, Nutrition, and Health Promotion

Community Engagement Awards: Dr. M. Cade Smith, Assistant Dean of Students and Director, Office of Student Leadership and Community Engagement Center for Community-Based Learning

Public Health Research Awards: Dr. Holli H. Seitz, MPH, Assistant Professor Department of Communication, Social Science Research Center

Thesis Research Competition Awards: Dr. Lori Mann Bruce, Ph.D., Giles Distinguished Professor of Electrical and Computer Engineering, Associate Vice President and Dean of the Graduate School

Theta Tau TomorrowBuilder Award: Amanda Gonzalez, Scribe Officer and Scholarship Head of Theta Tau Professional Engineering Fraternity

Subject Area Awards: Dr. David Dampier, Professor of Computer Science and Engineering, Mary Lyn and Niles Moseley Endowed Chair of Cyber Security, Director, Distributed Analytics and Security Institute, Phi Kappa Phi and Dr. Christopher Snyder, Professor of History and Dean of the Shackouls Honors College.

This symposium would not be possible without the hard work of the judges who work under time pressure to try to determine which excellent project is just a bit more excellent than the others.
If you see a judge, thank him or her.

Abstracts

BSE-01
Name, Major: Lauren Agcanas, Wildlife & Fisheries Science/Wildlife Science
Project Title: *Evaluating urine normalization methods in the giant panda and eastern tiger salamander urine*
Faculty Advisor, Department: Carrie Vance, Biochemistry and Molecular Biology
Project Type: Poster
Project Category: Biological Sciences and Engineering

Abstract: Stress and reproductive endocrinology has become pertinent in captive breeding programs. Valuable hormone information can be obtained via blood, fecal, and urine samples. Urine and fecals are easily and non-invasively obtainable, yet require normalization. Specifically in urine, water concentrations can vary drastically, thus a standardization analysis such as specific gravity (SG), creatinine (CR), or osmolarity (OS) must be implemented. Destructive assays, such as CR and OS, are of particular concern in cases involving low sample volume or highly valuable samples from rare or exotic species. In contrast, SG is a non-destructive measurement of concentration that has been validated against creatinine in urine from humans [Wyness 2016]; however, its use has yet to be validated in exotic or non-mammalian species. This study assessed the relationship between SG and CR in urine collected from two unusual species: 1) the giant panda (Ailuropoda melanoleuca); and 2) the eastern tiger salamander (Ambystoma tigrinum). Samples (n=20 per species) were centrifuged, vortexed, and measured in triplicate for SG and CR values. Specific gravity was obtained from neat samples (100µl) using an ATAGO digital hand-held refractometer (PAL-10S). Urinary CR concentrations were obtained by a colorimetric assay (λ=490nm) using a 1:2 dilution in salamanders and a 1:20 dilution in pandas. Results displayed a broader SG range (1.002-1.019) and CR range (0.3028–304.8 mg/dL) in pandas. Linear regression analysis between CR and SG, in panda urine, demonstrated a correlation with R2 value of 0.669 (y=0.0014x+1.0034). In contrast, salamander SG and CR ranges were 1.001–1.006 and 0.1387–5.586 mg/dL. With an R2 value of 0.0869, the linear regression analysis correlation was drastically lower in salamander urine (y=0.0004x+1.0019). Overall, low sensitivity demonstrated the ATAGO refractometer is not an accurate tool for measuring SG of salamander urine, but may be applicable with caution for SG measurements in panda urine.

BSE-02
Name, Major: Aaron Albee, Biological Sciences/Microbiology
Project Title: *Impact of occidiofungin on morphological switching in C. albicans*
Faculty Advisor, Department: Dr. Donna M Gordon**,** Cellular Biology
Project Type: Poster
Project Category: Biological Sciences and Engineering

Abstract: Occidiofungin is a novel antifungal compound shown to have broad fungicidal properties. The aim of this study was to characterize the effects of occidiofungin on the dimorphic switching of C. albicans. To induce filament formation, cells grown to saturation in YPD at 30˚C were diluted into fresh media and placed at 37˚C. A sublethal dose of occidiofungin (0.5X MIC) was then added and samples removed at defined time intervals for analysis by spotting, CFU determination, and microscopy. Spotting and CFU data confirmed that occidiofungin was fungicidal under these conditions. Interestingly, occidiofungin inhibited morphogenic switching with some cells still accumulating small abnormal hyphae. These defects were analyzed by Calcofluor white staining. Unlike previous findings in S. cerevisiae which showed an increased upregulation of chitin when exposed to occidiofungin, C. albicans showed no apparent changes in cell wall accumulation of chitin. When occidiofungin was added to cells that had already undergone morphogenic switching, the impact on cell viability was less pronounced, although higher doses of the antifungal compound remain to be tested. Overall, the data shows that occidiofungin has inhibitory effects on C. albicans when added prior to morphogenic switching. This study identifies multiple modes of effects to be studied within C. albicans when treated with occidiofungin to fully understand the mechanisms of how this compound triggers antifungal properties.

SS-01
Name, Major: Audrey Alexander, Psychology
Project Title: *Body Image and Sociocultural Pressures as a Predictor for Depression, Stress, and Anxiety*
Faculty Advisor, Department: Dr. Kristina B. Hood**,** Psychology
Project Type: Poster
Project Category: Social Sciences

Abstract: Research found gender differences in how body image influences depression and anxiety (Stice, & Bearman, 2001). Body Mass Index (BMI) has been found to interact with this relationship such that those who are overweight felt more depression than obese or normal ranged women (Revah-Levy et al., 2011). Sociocultural influences—pressure to be thin—have also been found to change the associations between body image and stress, depression, anxiety, and general poor mental health symptoms (McCabe, Ricciardelli, & Holt, 2010). Controlling for BMI, research found that body image perceptions predicted the likelihood of depressive and anxious symptoms (Kostanski, & Gullone, 1998). Studies also discovered that this relationship still existed for a population in Switzerland after controlling BMI, gender, and age (Richard, Rohrmann, Lohse, & Eichholzer, 2016). This research aimed to determine if after controlling BMI and gender, whether perceived sociocultural pressures to be thin and shape/weight concerns would predict higher levels of depression, anxiety and stress. Data was collected from 441 participants from a South African university. To evaluate body image, weight and shape subscales were analyzed from the Eating Disorder Examination Questionnaire (Fairburn, & Beglin, 1994). To analyze sociocultural pressures, the Perceived Sociocultural Pressure Scale was used (Stice, Nemeroff, & Shaw, 1996). To evaluate levels of depression and anxiety, the Depression, Anxiety, and Stress Scale results were analyzed (Lovibond, & Lovibond, 1995). A hierarchical multiple regression yielded that after controlling for BMI and gender, perceived sociocultural pressures and weight and shape concerns significantly predicted depression, anxiety and stress $F(380)=14.572, p<0.001$. The more pressure felt to be thin and the weight and shape concerns, the more depressed, anxious, and stressed the participant was. This project shows the importance of mentoring in schools to improve body images for everyone and demonstrates a world-wide issue. Future study should research ways to increase body positivity.

SS-02
Name, Major: Clayton Allred, Psychology
Project Title: *The Impact Social Withdrawal in Depression has on Social Functioning*
Faculty Advisor, Department: Jared Keeley, Psychology, Virginia Commonwealth University
Project Type: Poster
Project Category: Social Sciences

Abstract: Depression is a major health concern worldwide, particularly through its impact on individuals' level of functioning. While anhedonia, or loss of interest, has been widely researched and is indeed considered one of the core symptoms of depression, noticeably absent from the study of depression and social functioning is an examination of social withdrawal. We developed the Social Withdrawal Scale (SWS) to examine if social withdrawal predicts social functioning above and beyond symptoms of depression and anhedonia. The SWS was modeled after the Specific Loss of Interest and Pleasure Scale (SLIPS; Winer, Veilleux, & Ginger, 2014) to assess change in social withdrawal over the past month. We compiled a survey that included the SWS along with other measures of depression and social functioning and launched this survey online on Amazon MTurk. MTurk workers were paid $0.75 to complete the survey. The data cleaning resulted in 374 participants being included in the final analyses (57.2% female, 42.0% male). We conducted hierarchical regressions with the BDI-II (BDI–II; Beck et al., 1996), SOFAS, and SWS as predictor variables, and measures of social functioning as the outcome variables. The SWS did in fact predict additional variability in social functioning accounted for by the BDI and the SLIPS. The SWS demonstrated good convergent and divergent validity. As expected, the SWS was most closely related to the SLIPS because social withdrawal and loss of interest are very similar, although distinct constructs. Our study suggests that social withdrawal does indeed predict social functioning above and beyond symptoms of depression and anhedonia. We hope the SWS will be used in future studies as well as a supplement to traditional measures of depression.

BSE-03
Name, Major: Bailey Archey, Animal and Dairy Sciences
Project Title: *Potential of Infrared Thermal Imaging Technology for Early Prognosis of Male Fertility*
Faculty Advisor, Department: Jean Feugang, Animal and Dairy Sciences
Project Type: Poster
Project Category: Biological Sciences and Engineering

Abstract: Thermal imaging (TI) is a technique that converts the invisible radiation pattern of an object into visible images for feature extraction and analysis of surface gradient temperature variations. Firstly developed for military purposes, infrared thermal imaging has gained wide applications in agriculture, medicine, and veterinary science. Previous studies have demonstrated its non-invasive, non-contact, and non-destructive use to determine temperature distribution of testes of various males. We explored the capability of this technology for early prognosis of semen production in young bulls. Sixty bulls of various breeds grouped per age as young (G1: 265 days), medium (G2: 316 days) and old (G3: 419 days) were assessed. At the onset of the study (T1), thermal imaging and circumference (SC) of scrotums were taken. These parameters were re-taken three months later (T2) together with a complete breeding soundness (BS) exam providing proportions of viable spermatozoa and semen quality score. Group age (G1, G2, and G3) and period (T1 and T2) effects on all parameters were evaluated by GLM-ANOVA. Correlations were tested with Spearman test with $P<0.05$ as the threshold of significance. Thermal imaging revealed comparable temperatures across age groups at T1, which decreased at T2 ($P<0.05$). At T2, SC of bulls increased ($P<0.05$) and remained significantly different between age groups. Semen quality and sperm viability were comparable between G2 and G3 groups, and remained higher than that of G1 ($P<0.05$). Both SC and TI showed positive and significant correlations with analyzed semen parameters. The TI data revealed better correlations at T1 (>0.2); but SC had stronger correlations at all time points (>0.4). This preliminary study indicates thermal imaging technology as a weak predictor of semen production in yearling bulls. Investigations regarding breed effects are still ongoing. Supported by USDA-ARS Grant# 58-6402-3-018.

BSE-04
Name, Major: Anna Autrey, Biological Sciences
Project Title: *Effects of Genetically Modified Plants on Ecological Systems*
Faculty Advisor, Department: Brandon Barton, Biological Sciences
Project Type: Poster
Project Category: Biological Sciences and Engineering

Abstract: Commercial enthusiasm about genetically modified plants has heightened concerns of environmental and ecological risks with reference to these plants and the effects they contribute. This study explored the effects of genetically modified soy bean plants on the reproductive characteristics of soy bean aphids. This included an examination of four gene modifications and their impact within an ecological system. Examination of these results revealed that aphids reproductive behavior varies based on the plant they derive nutrition from. Each specific gene variation within a soy bean plant yielded different reproductive quantities within the aphid population. This experiment shows how risk is connected between genetically modified plants and environmental systems.

SS-03
Name, Major: Katie Bailey, Human Sciences/Apparel Textiles & Merchandising
Project Title: *Parental Involvement and classroom perceptions*
Faculty Advisor, Department: Dr. Charles Freeman, School of Human Sciences
Project Type: Poster
Project Category: Social Sciences

Abstract: Parental involvement in their child's education has been a long time topic of interest. This research proposal focuses on the effects of parental involvement in their child's education. Using qualitative research, we will interview elementary teachers by asking them the following questions: 1. Can you tell the level of involvement between parent and child from the ones who attend school events/conferences and the ones who do not? 2. Do you find that parents who do not attend special events and help out in the classroom often times have the children with the most behavioral problems? 3. What's the percentage of parents that set up parent-teacher meetings/phone calls? 4. Do you send home behavioral sheets daily for the parents to sign? What percentages of parents are responsive to these behavioral sheets? 5. Out of the parents who seem less involved, are students less engaged in class activity and/or participation? 6. What kind of incentives do you have to encourage the student to behave in the classroom? This research will help us better understand how much of an impact parent's make in their child's education. The big question is: does parent involvement in their child's education affect their performance and behavior in the classroom?

BSE-05
Name, Major: Mary Bailey, Biochemistry
Project Title: *Evolution and Phylogeny of RAF Genes*
Faculty Advisor, Department: Federico Hoffmann, Biochemistry and Molecular Biology
Project Type: Poster
Project Category: Biological Sciences and Engineering

Abstract: The RAF family of proteins is of particular interest for two reasons. Due to RAF proteins' functions in cell proliferation in the Ras-Raf-MEK-ERK pathway, mutations in these genes create the potential for cancerous tumors; in fact, many tumors have been attributed to RAF mutations. Secondly, there are three RAF isoforms in mammals, while invertebrates have only one. The main focus of this research is to determine when and how the gene diverged into three separate, uniquely functioning paralogs. The paralogs have both overlapping functions and essential non-overlapping functions, as made evident by mouse knock-out studies. While each paralog shares the function of activating ERK signaling, they also have unique roles. BRAF, the prototypical paralog, is the most potent ERK activator and particularly essential in the placenta during embryonic development of mice. ARAF has been shown to bind to MST2, thus inhibiting apoptosis, much more strongly than BRAF. In addition, ARAF possibly acts as a scaffolding protein that helps stabilize BRAF:CRAF heterodimers. CRAF is an essential regulator of keratinocyte migration via its interactions with ROKα, and CRAF also plays a role in the stability of endothelial cell-cell junctions. A combination of phylogenetic and syntenic bioinformatic methods were used to analyze genomic data from vertebrates and invertebrates. The results from this research have helped to reconstruct the evolutionary history of RAF genes and determine when ARAF and CRAF diverged from BRAF.

AH-01
Name, Major: Jasmine Ball, Human Sciences/Apparel Textiles & Merchandising
Project Title: *For Every Occasion*
Faculty Advisor, Department: Charles Freeman, School of Human Sciences
Project Type: Poster
Project Category: Arts and Humanities

Abstract: Clothing in the 1960's was very diverse in style compared to any other time period. Short hemlines, tight bodices, and colorful designs were very popular and trendy. At this time, juniors apparel was very versatile. This Betty Barclay junior design is a long sleeved dress made out of cotton and polyester with a knit fabric structure. The color of the dress is cream with black horizontal and vertical black stripes. Around the neckline, there is white decorative cotton lace trim with an adorable black ribbon placed in the center. This piece is still in great condition with minor discoloration. Now this garment is safely placed in our Historic Costume and Textile Collection. According to research files, the dress was worn and used in south Mississippi. We can predict that juniors wear was worn to more than one occasion in one day. However, we don't know if it was particularly worn just in Mississippi and if the dress was worn for many occasions. Therefore, the purpose of this case study is to find out what the dress was used for and who wore it. We will collect information through our database and find historical facts about the time period, comparing the findings to contemporary images and research to date. We can hypothesize that this dress was worn by a middle class young teenage girl, who liked to dress in modern styles to a variety of occasions.

BSE-06
Name, Major: Josh Bankston, Forestry/Forest Management
Project Title: *Plot size and prediction model form effects on stand diameter distribution recovery methods*
Faculty Advisor, Department: Charles Sabatia, Forest Biometrics
Project Type: Poster
Project Category: Biological Sciences and Engineering

Abstract: Diameter distribution information of a forest stand provides insights in to the stand's value. In whole stand forest growth and yield systems, the future diameter distribution of a stand gets predicted by use of models that predict the stand's diameter moments and/or percentiles in conjunction with a mathematical system to recover the diameter distribution from the predicted moments and/or percentiles. Weibull probability distribution is widely used to model the predicted diameter distribution. A few studies have compared Weibull distribution recovery systems based on moments only to those based on moment-percentile hybrid approaches. The studies arrived at varied conclusions regarding the best approach of recovering a stand's future diameter distribution from predicted stand level statistics. In the current study, we investigate the possible effects of plot data quantity (determined by plot size) and form of moments/percentiles prediction models on the precision of the Weibull distribution recovery approaches. The results of these analyses will be presented.

AH-02
Name, Major: Zoë Barfoot, Human Sciences/Apparel Textiles & Merchandising
Project Title: *Burn-out Velvet*
Faculty Advisor, Department: Lori Neuenfeldt and Charles Freeman, Human Sciences
Project Type: Talk
Project Category: Arts and Humanities

Abstract: In 2000, a woman's jacket from around the 1870s or 1880s was donated from the University of North Texas. The jacket is hand sewn using cotton and has a burn-out velvet floral motif. The lining has been reinforced due to time and wear. However, buttons are missing and the designer or person who owned it is unknown. The use of the jacket is also unknown. Therefore, the purpose of this case study is to discover who designed and owned the jacket and what season and occasions the jacket could have been worn. I plan to research what kind of buttons were popular and could've been used. I also plan to study the history of Texas at the time to learn who wore and made the jacket and why. Considering the size and fabric of the jacket I believe that it was made for a young girl of a wealthy family and was most likely used during fall or winter for everyday use.

AH-03
Name, Major: De'Andrea Barr, Human Sciences/Apparel Textiles & Merchandising
Project Title: *The Little Black Dress and Women*
Faculty Advisor, Major: Charles Freeman, School of Human Sciences, Fashion Design and Merchandising
Project Type: Poster
Project Category: Arts and Humanities

Abstract: The "little black dress" was a phrase ascribed to Coco Chanel for revolutionizing a black dress to be seen as more than the color of mourning in the 1920s. This changed the way the fashion world viewed black and black dresses because now, little black dresses were used to show versatility in an everyday woman's style, especially during this time where many women were employed. It was important to show how one dress could go from business to evening party. As time progressed, the economy got worse and the idea of needing a versatile dress after the Great Depression was no longer a thought. Women were now being called to help uplift and support the country in a time of crisis, whether that meant working or being a traditional house wife, and the style of clothing was changing to express a new role of women and their importance to the country. The black dress evolved and dresses were being offered with a more functional design such as a loose fit, but with added detailing such as shoulder pads and designs to show strength yet femininity. This particular dress is a loose flowing wool crepe, machine stitched garment with an off white satin flounce. The poster display will provide a history of dress and women and how this dress symbolized a strong working woman during a time of depression, as well as photographs and details of the construction of the dress.

BSE-07
Name, Major: Courtney Baugher, Animal & Dairy Sciences
Project Title: *Inoculated Deep Litter Systems in the Swine Industry*
Faculty Advisor, Department: Heather Jordan, Biological Sciences
Project Type: Poster
Project Category: Biological Sciences and Engineering

Abstract: As the animal production industry grows, concentrated animal feeding operations (CAFOs) including piggeries are becoming more popular, leading to an increase in waste management issues. Conventional methods involve housing with grated floors that allow waste to flow to holding areas below these facilities. Waste is then transferred to storage facilities until it can be applied as fertilizer, or it is sent to a treatment facility. Not only do these methods lead to foul odor but they also lead to an increase in labor requirements, environmental pollution, and animal stress. To combat these issues, Inoculated Deep Litter Systems (IDLS) have been implemented in small-scale swine operations. IDLS is a sustainable farming method that provides a natural waste management system that reduces moisture, eliminates odor, decreases pollution and leads to an increase in production through reduced stress and illness. It is a five-layer system of green waste that is inoculated with indigenous microorganisms (IMO) to provide low maintenance, federally approved waste management. Though IMOs must be cultivated, no specific microbe has been identified as the organism responsible for this sustainable waste system. Furthermore, it is unknown whether a core microbial taxa is shared between multiple IDLS farms. To identify the responsible microbes, this study used the isolation and molecular analyses of nucleic acids from feces, soil, IMOs, and feed samples collected from three piggeries that incorporate IMOs into their bedding system and three piggeries that do not.

PSE-01
Name, Major: Tylon Beckwith, Industrial Engineering
Project Title: *Stochastic Programming Model with Solar Energy Resources and V2G Systems under Uncertainty*
Faculty Advisor, Department: Dr. Mohammad Marufuzzaman, Industrial and Systems Engineering
Project Type: Poster
Project Category: Physical Sciences and Engineering

Abstract: The number of electric vehicles (EVs) has been growing at a staggering pace in recent years because of their low operating costs, potentials for energy sustainability, and zero tailpipe emissions. EVs will be required to charge in charging stations connected to the grid network. Such charging stations require high power during the day, especially when the network could be overloaded, hence there is the need to model EVs' impact on the power grid. The increased electric vehicles also increase electrical grid demand which may increase high level emission from petroleum-electrical generation instead of reducing it. Yearly as well as hourly time-varying electricity pricing adds another dimension to this problem. Due to the scarcity of fossil fuels and the negative consequences of using them, renewable energy sources are required to be coupled with power grid as an alternative clean source of electricity. However, the projected increase of EV usage and integration of renewable energy sources along with Vehicle-to-Grid (V2G) technology for EV charging presents opportunities as well as challenges. This paper investigates the possibility to use V2G to shave peak power demand and optimizes the renewable energy sources for EV charging stations. We develop a two-stage stochastic program which, in the rst stage, determines where to locate charging stations, and in the second stage determines the real-time power transmission among the power grid, renewable resources, and the EVs. To solve the model, we utilize a hybrid approach that combines Sample Average Approximation (SAA) with an enhanced Progressive Hedging (PH) algorithm. Along with SAA and PH we apply some heuristics such as Rolling Horizon (RH) algorithm, penalty parameter updating technique, and a bundle xing technique to enhance the performance PH algorithm. We choose Washington DC as a testing ground to visualize and validate the model's results. Our computational results provide a number of managerial insights to the decision makers while indicating robustness of the proposed algorithm as well.

SS-04
Name, Major: Joshua Bedi, Economics (B&I)
Project Title: *Immigration and Baumolian Entrepreneurship*
Faculty Advisor, Department: Travis Wiseman, Finance and Economics
Project Type: Poster
Project Category: Social Sciences
Other Categories: TRC

Abstract: We investigate the association between immigration and entrepreneurship in the United States. Previous studies of this relationship focus primarily on specific immigrant populations – e.g., H-1B visa holders and other highly skilled immigrants – and narrow, often single-variable definitions of innovation and entrepreneurship – e.g., sole proprietorship or patent applications per capita. We revisit the question on immigration and entrepreneurship, focusing more generally on immigrants of all skill-sets but giving special attention to authorized and unauthorized immigrant populations. Additionally, we use broader measures of entrepreneurship that capture both productive, wealth-generating activity as well as behavior that proxies for wealth redistribution and destruction. In entrepreneurship regressions, we show that the share of both legal and illegal immigrants in a state’s population relate positively and significantly to productive entrepreneurship and negatively to unproductive entrepreneurship.

BSE-08
Name, Major: Reed Bigham, Biological Engineering
Project Title: *Development of Volatile Organic Compound Library for Detection of Sweet Potato Root Tip/End Rot Caused by Macrophomina phaseolina (Charcoal Rot Fungal Pathogen): Phase 1 Host Tissue Library*
Faculty Advisor, Department: Richard Baird**,** Biochemistry, Entomology and Plant Pathology
Project Type: Poster
Project Category: Biological Sciences and Engineering

Abstract: The soil-borne fungal pathogen, Macrophomina phaseolina (Mp), is notable for its global presence and ability to cause diseases in a considerable amount of the world's agricultural produce. It is most prominently known for its tendency to cause the formation of external and internal end-rot disease complexes, which create a significant postharvest complication in sweet potatoes. With Mississippi being the third largest producer of sweet potatoes in the United States, it is of the utmost importance to develop prevention practices that will lessen the economic impact of this agriculturally destructive pathogen. For internal rot, which cannot be seen at the producer's level during storage or packaging lines, these prevention practices will enable the grower to ensure quality produce in the market place. To achieve this goal, rapid-diagnostic portable detection equipment, which can be used within a warehouse, is being developed to identify unique microbial volatile organic compounds (MVOCs). These MVOCs, which are essentially chemical odors or signatures, are identified using solid phase microextraction (SPME) fibers in order to recognize the unique chemical makeup of Mp and bypass other naturally occurring saprophytic microbes of no consequences. This research is being conducted using two different approaches, with one looking directly at VOCs of Mp isolate types and the other, which is the basis of my research, composing a chemical library of VOCs associated with different varieties of sweet potato root and shoot tissues. The formed library will be used as an indicator for infection initiation and progression by comparing the sweet potato tissue VOCs with the findings from the project identifying Mp isolates' VOCs. During this study, VOC's from sterile root and shoot tissues of three varieties of sweet potatoes were tested using headspace solid phase microextraction gas chromatography mass spectrometry (HS-SPME-GCMS). The analysis of plant tissues and preliminary data will be presented.

AH-04
Name, Major: Demi Blaker, Human Sciences/Apparel Textiles & Merchandising
Project Title: *1900's Mystery Coat*
Faculty Advisor, Department: Charles Freeman and Lori Neuenfeldt, School of Human Sciences
Project Type: Poster
Project Category: Arts and Humanities

Abstract: The Historic Costume and Textiles Collection at Mississippi State University holds an embellished, wool overcoat from the 1900's that does not have information on the designer. We know that this coat was received by the Mississippi State University Historic Costume and Textiles collection in 1998 by the Tucker family. This overcoat from South Carolina is made of cream wool and trimmed with white and black braiding; the inside of the coat is lined with light blue silk. However, we do not know the designer of the coat nor where it was made and also whether this specific coat was mass manufactured. Therefore, this investigation is to research who designed this coat, where its originated and also if it was mass-manufactured or special made. I hypothesize that the coat was specially made and was not mass-manufactured and that the designer made one original of each piece and did not create another.

SS-05
Name, Major: Rachel Booth, Psychology
Project Title: *Administrative Data Use in Mississippi Tobacco Policies*
Faculty Advisor, Department: Robert McMillen, Psychology
Project Type: Poster
Project Category: Social Sciences
Other Categories: Community Engagement, Public Health

Abstract: Tension surrounds two potential types of tobacco policies in Mississippi. On the state level there is a tobacco tax but not a smoke-free ban, and on the community level municipals cannot change the tax price from the state's price but may pass a smoke-free ordinance. Although evidence shows health and financial benefits of these policies, some individuals, including lawmakers, may feel that smoke-free ordinances hinder businesses' economic growth. For example, the concern is that fewer people will bring business to places like casinos due to smoking regulations, and often people oppose tax increases on principle. We looked at administration data such as tax records, gaming data and hospital admissions rates to see the financial and health effects of tobacco policies. We found from administrative data composed of 28 Mississippi towns' Tourism and Economic Development (TED) tax data and one voluntarily smoke-free casinos' gaming data demonstrate that neither towns nor the casino suffer economically from smoke-free ordinances. Furthermore, admission data from three hospitals in two communities with smoke-free ordinances show decreases in heart attack admissions to hospitals. Administrative data can help to inform efforts to increase tobacco policies and benefit the health and financial well-being of Mississippi.

BSE-09
Name, Major: Robby Brannum, Biological Sciences
Project Title: *Effects of Seasonality on the Location of Melitara Prodenialis within the Tissues of Opuntia Pusilla*
Faculty Advisor, Department: Christopher Brooks, Biological Sciences
Project Type: Poster
Project Category: Biological Sciences and Engineering

Abstract: Prickly Pear cacti are associated with groups of cactus feeding moths whose larvae parasitize the plant and feed on the internal tissues. These insects are subjected to many of the same ambient conditions that the host is exposed to. Understanding how internally feeding insects respond to the plants ambient environment could provide insight into the life cycles of these moths while also providing preliminary data on what factors potentially influence the moth's population stability. We have observed that the primary host of Melitara prodenialis locally, Opuntia pusilla, exhibits a winter response in which the plant's cladodes become wrinkled and the entire plant lies prostrate on the ground. These moths lay their eggs on the stems (called cladodes) and spines of prickly pear cacti in warmer months, and the larvae hatch and burrow into the stem to feed on the inside of the cladode. Since they overwinter as caterpillars inside these plants, we hypothesize that seasonality affects where M. prodenialis resides in O. pusilla during the winter. In order to test this, we collected samples of O. pusilla in both the fall and the winter. Plants were cut at ground level to separate the above and below ground portions. The roots were dug up and the plants were brought to the laboratory for dissection. It was noted where infestation was located within the plant. We found that infestation was low throughout our sample size and that all infestation was above ground. Due to the fact that it was a warm winter and low sample size, we cannot conclude if seasonality does affect the position of the caterpillars within the plants. However, these results do suggest that caterpillars of M. prodenialis do remain in the above-ground cladodes during winter.

BSE-10
Name, Major: Meghan Brino, Biological Sciences
Project Title: *In Vitro Oxime Combination Therapy of Rat Brain Acetylcholinesterase Inhibited by Organophosphates*
Faculty Advisor, Department: Janice E. Chambers, Center for Environmental Health Sciences (Basic Sciences)
Project Type: Poster
Project Category: Biological Sciences and Engineering
Other Categories: Public Health

Abstract: Recent assassinations and terrorist attacks demonstrate the need for a more effective antidote against nerve agents and other organophosphate (OP) compounds that inhibit nervous system acetylcholinesterase (AChE). This study explored the reactivation potential of novel phenoxyalkyl pyridinium oximes (U.S. patent 9,277,937) that have demonstrated the ability to cross the blood-brain barrier. The in vitro assay evaluated combination therapy of a novel oxime plus the currently accepted antidote, 2-PAM, to assist in explaining earlier in vivo experiments in rats in which some of the combinations yielded poorer survival of lethal OP dosages than did single oximes. Three OPs were tested: nitrophenyl ethyl methylphosphonate (NEMP; a VX surrogate), phthalimidyl isopropyl methylphosphonate (PIMP; a sarin surrogate), and paraoxon (PXN), a metabolite of the insecticide parathion. Reactivators tested included 2-PAM and novel oximes 1, 15, 20, 55, and 62. All three OPs were treated with 100 µM concentrations of oxime, and PXN and PIMP were also treated with 50 µM concentrations. Three reactivation conditions were evaluated: a novel oxime, 2-PAM, and a combination of 2-PAM and novel oxime. For each assay, rat brain homogenate was incubated with a concentration of OP yielding AChE inhibition of 80-90%. Reactivation was initiated with an oxime or mixture of two oximes, and AChE activity in the samples was assessed using the substrate acetylthiocholine. Following addition of a chromogen, the absorbance was quantified spectrophotometrically. Reactivation was calculated by comparing the oxime-treated samples to the non-oxime-treated samples. Depending on the conditions, combinations of 2-PAM and novel oxime achieved a range of reactivation spanning 10 to 90%. Reactivation values for the combinations were largely lower than or equivalent to those of 2-PAM alone, with some notable exceptions. For those particular oximes, combination therapy provides a promising alternative to the current antidote. (Support was provided by NIH U01NS083430.)

PSE-02
Name, Major: Joshua Broussard, Geosciences/Professional Geology
Project Title: *Using Confocal Microscopy to Attempt to Image and Understand Pore Space Networks*
Faculty Advisor, Department: Brenda Kirkland, Sedimentology and Carbonate Sedimentology
Project Type: Poster
Project Category: Physical Sciences and Engineering

Abstract: Understanding pore networks in carbonate and siliclastic rocks is important to many geoscience and engineering disciplines. Currently porosity imaging is being conducted by many different methods, which include Computerized Tomography (CT) scanning and 3D mapping. However, these techniques for mapping pore networks are expensive and time consuming for project developers. The objective of this research is to create a quick and efficient method in imaging and analyzing the basic pore network of carbonate and siliclastic rocks. Using confocal microscopy, carbonate and siliclastic rocks will be analyzed in an attempt to image their pore spaces, and more importantly the interconnectivity of those pore spaces, at a higher resolution than is allowed by traditional techniques. The rock samples will be sectioned into thick thin-sections, greater than 30 microns, then impregnated with florescent dyes based on their composition and complexity. An Axiovert 200 M Inverted Research confocal microscope will be used for analysis. Images will be collected at 10 – 30 milliwatts (mW). The pores of the sample will be filled with florescent dyes. These dyes will show any pore features in each layer. The layers may then be stacked to create a basic pore network map. The goal of this work will be to create a layered three dimensional image of the sample. Results from these methods can help scientists and engineers better understand the pore categorization, pore wall structures, and flow pathways for better predictive modeling, and porosity and permeability estimation. The images obtained by this method can be used for multiple applications including carbon sequestration, petroleum engineering and groundwater modeling.

PSE-03
Name, Major: Alicia Brown, Chemical Engineering
Project Title: *A Density Functional Theory Study of Benzene and Phenol on Bimetallic Phosphide Surfaces*
Faculty Advisor, Department: Neeraj Rai, Chemical Engineering
Project Type: Poster
Project Category: Physical Sciences and Engineering

Abstract: In the past few years, research interest in biomass conversion to fuels and chemicals has increased significantly with growing concern about the depletion of fossil fuels. A crucial element of biomass conversion is finding an effective means of catalytically upgrading these fuels and chemicals to remove phenolic compounds, as fuels with high concentrations of these compounds are characterized by low stability, low volatility, and high viscosity. Bimetallic catalytic surfaces are especially conducive for reducing the oxygen content of these fuels because synergistic interactions between the metal components allow for greater electron density, selectivity, and stability than monometallic surfaces. Further, the incorporation of non-metallic atoms such as phosphorous can enhance the properties of the metals by altering the distribution of the charge between metals. In this study, we examined the catalytic activity of the NiMoP bimetallic catalyst for the deoxygenation of phenolics using the density functional theory (DFT) method. In particular, we examined the bulk properties of the catalyst and the adsorption of phenol and benzene on the 001 and 112 Miller Index surfaces in order to identify the most likely deoxygenation mechanism for each surface. By introducing these probe molecules to each surface, we were able to identify which surface would be more favorable in terms of reaction selectivity and number of active sites, as well as gain a greater insight into the optimal molar ratio for this catalyst.

SS-06
Name, Major: Claire Bryan, Human Sciences/Human Dev & Family Studies
Project Title: *Effects of athletic apparel on workout behavior*
Faculty Advisor, Department: Dr. Joe Wilmoth & Dr. Charles Freeman, School of Human Sciences
Project Type: Poster
Project Category: Social Sciences

Abstract: Across Mississippi State University's campus, we have noticed an abundance of females wearing activewear. We are researching how activewear relates to the time females spend working out. We will gather quantitative data through observations and administration of surveys across campus. In a study conducted on the athletic brand Lululemon, researchers found we undergo a mental change when wearing certain clothing, called "enclothed cognition", meaning it is likely when one wears activewear, they become likely to participate in exercise. Research does not explain if there is a correlation between women wearing activewear and their exercise habits. Since little information has been previously collected, we want to further develop research to find the correlation of activewear choices and exercise habits. We will position ourselves across campus and record the number of females wearing activewear. For our study, activewear will be considered leggings, athletic material shorts, and casual athletic tops. Every 10 females that pass wearing activewear will be asked to complete a quick survey of three questions. The survey will ask how many days a week they workout, how many minutes their workout last, and how many days per week they wear activewear. We will print surveys for participants to fill out, identifying each paper with a pre-labeled number. From these observations and surveys, we will be able to assess whether wearing activewear relates to the likelihood one will exercise. We expect to see a correlation between activewear and exercise, showing activewear increases one's likelihood to workout. Upon completion of our research, we will analyze the data by creating graphs to show the number of females who wear activewear and the time they spend working out. Our results will provide insight to the correlation between the popularity of activewear among college-aged females and their likelihood to exercise.

SS-07
Name, Major: Zach Buchanan, Psychology
Project Title: *Reducing Social Demands in Child Eyewitness Memory Using Robot Interviewers*
Faculty Advisor, Department: Deborah K. Eakin, Psychology
Project Type: Poster
Project Category: Social Sciences

Abstract: The misinformation effect is the finding that memory for a witnessed event is impaired when misleading information is presented after the initial viewing. Research has shown that children are especially susceptible to endorsing misleading information, particularly when adults present the misleading information. One proposed explanation is that children are aware of the social demands surrounding child/adult interactions and endorse misleading information to please authority figures. The National Institute of Child Health and Human Development developed a protocol designed to limit the presence of these social demands in child eyewitness interviews; however, a recent study showed being interviewed by a robot significantly ameliorated the misinformation effect. The proposed explanation for these memory findings is that the social demands inherent in human interviewers were not present in robot interviewers. The current study sought to investigate why the implementation of this protocol failed to limit these social demands in human interviewers and how the interview procedure differed between human and robot interviewers, despite the implementation of the NICHD protocol. I analyzed the content of the interactions between the children and human or robot interviewers. I coded verbal and nonverbal cues, including word counts, question types, insertions of prior knowledge, and types of interviewer responsiveness. The human interviewer spoke significantly more to children, but only during the initial rapport building phase. Additionally, the human asked more questions (open- and closed-ended), provided more affirmations, and exhibited more nonverbal encouragement; the human also interjected more prior knowledge into the interview, violating a rule of the NICHD protocol. The robot, less able to interject spontaneous conversation and connect with the children through verbal and nonverbal responsiveness, was more ideal than a human interviewer. The lack of social demands inherent in the robot ameliorated the impact of the misleading information on children's memory.

AH-05
Name, Major: Hunter Burton, Forestry/Forest Management
Project Title: *Assessing impacts of best management practices on water quality in the Catalpa Creek watershed*
Faculty Advisor, Department: Courtney Siegert, Forestry
Project Type: Poster
Project Category: Arts and Humanities

Abstract: In the past, a great deal of attention has been given to understanding the relationship between agricultural activities and degradation of water quality. For example, the presence of livestock near streams results in elevated levels of nutrient and sediment runoff. The use of Best Management Practices (BMPs) to mitigate these problems is common, but differences in climate, landscape conditions, and BMP implementation lead to varying degrees of success. With headwaters on the MSU (Mississippi State University) campus, Catalpa Creek Watershed has been labeled an impaired watershed because excessive levels of nitrogen, phosphorus, and fecal coliforms. The primary objective of this project is to quantify the effectiveness of agricultural best management practices and implement these solutions to rectify water quality deficiencies within the Catalpa Creek watershed. Precursory attempts to control negative impacts of both urban and agricultural land uses by MSU have failed in maintaining stream quality in this important watershed. Current land use includes 44% in hay production/pasture land, 10% in cultivated crops, 9% in developed land, and 8% in wetlands or open water – a large portion of which resides in MSU property. Our approach includes various attempts at reducing nutrient loading and sedimentation of Catalpa Creek through combinations of individually tested and proven agricultural BMP's for the various land uses found in this watershed. To achieve accurate results and positive impacts, one year of baseline data will be compared to sampled data from four separate sites that will exemplify the effectiveness of individual and combined BMP implementations from various sampling positions along the creek within the areas of greatest distress. The greatest impact of this research will be the implications that can be used by large and small landholders to improve planning for restoration and protection of water resources for quality of life and human health as well as ecosystem and wildlife conservation.

BSE-11
Name, Major: Joshua Byers, Forestry/Forest Management
Project Title: *Prescribed Fire in Upland Oak Forests: Impacts on Canopy Cover, Organic Layer, and Seedling Density*
Faculty Advisor, Department: Dr. Heather D. Alexander, Forestry
Project Type: Poster
Project Category: Biological Sciences and Engineering

Abstract: Across the eastern United States, upland hardwood forests are shifting from predominantly oak, to more competitive, shade tolerant species due to lack of fire in the ecosystem. Prescribed fire may help reduce competition from shade tolerant species, increase understory light for shade-tolerant oaks, and reduce soil organic layer depth and improve seedbed conditions for acorn germination. As part of a long-term seedling population study at Bernheim Arboretum and Research Forest in Clermont, KY, single and multiple (2x) fires were applied over 3-yr and 5-yr periods to compare burn treatment variables on six sites paired with unburned plots. After a chestnut oak (*Quercus montana*) masting event, soil organic layer depth, canopy cover, and tree seedling densities were measured for tree species < two years old of red oak (*Quercus* sect. *lobatae*), hickory (*Carya* spp.), red maple (*Acer rubrum*), chestnut oak, and white oak (*Quercus alba*). On burned sites, canopy cover and soil organic layer depth decreased dramatically; overall, red maple seedlings were the most abundant species (ranging 150+ on some plots), while oak and hickory seedlings were considerably lower in comparison to control sites. Because fires had minimal impact on canopy cover, and oaks require high light levels to survive, burns were ineffective at promoting oak regeneration. Results suggest that fires may not create conditions that improve establishment of oaks over shade tolerant species. In the future, without sufficient over-story mortality from burning, a shift away from oak dominance may continue.

BSE-12
Name, Major: Rosevone Byrd, III, Biological Engineering
Project Title: *Engineering a Low Cost Innovative On Stage Incubator for Live Cell Imaging*
Faculty Advisor, Department: Dr. Renita Horton, Agricultural and Biological Engineering
Project Type: Poster
Project Category: Biological Sciences and Engineering

Abstract: The ability to image cells in culture can provide vital insight into cell dynamics. However, many microscope incubation systems can cost upwards of $10,000, which can be a hindrance for small research teams. Additionally, these systems are not easily portable. In this project we will design, build, and test a portable incubator system for live cell imaging. We will begin by conducting a market analysis of current state of the art on stage incubator systems, to identify and compare key features and limitations. Results from this analysis along with the requirements of our model culture system will inform our design decisions. The goal of this project is to build an affordable, portable on-stage incubation system that will aid in live cell imaging. This system can be instrumental in experiments utilizing cellularized microfluidic devices in that we can maintain optimal cell culture conditions on a microscope stage, resulting in more physiologically relevant data. We will show that this portable on stage microscope system can maintain temperature and humidity conditions similar to commercial systems, but at a fraction of the cost.

SS-08
Name, Major: Amanda Cailloutte, Secondary Education/Mathematics
Project Title: *Teacher Education Students' Perceptions of Diversity*
Faculty Advisor, Department: Qiana Cutts, Counseling, Educational Psychology and Foundations
Project Type: Poster
Project Category: Social Sciences

Abstract: The purpose of the proposed project was to extend research on teacher education students' (TES) perspectives of cultural critical consciousness, diversity and inclusion and examine how TES perceive their cultural critical consciousness and understand diversity and inclusion of k-12 students who have culturally and linguistically diverse backgrounds. Interviews were conducted with TES to assess their dispositions and experiences in order to identify those specific dispositions or implicit operating framework as related to cultural critical consciousness and to determine what diversity or inclusion experiences contributed to those dispositions.

PSE-04
Name, Major: Spencer Callicott, Computer Engineering
Project Title: *Analysis of Synthetic Graph Generation Methods for Directed Network Graphs*
Faculty Advisor, Department: Dr. Stefano Iannucci, Distributed Analytics & Security Institute
Project Type: Poster
Project Category: Physical Sciences and Engineering

Abstract: Problem Statement: Historically, scientific experiments have been conducted to generate scale-free network graphs based on structure. Metrics used to measure veracity ensure the integrity of a scale-free algorithm given a seed graph. However, studies do not explore the performance benefits/drawbacks of specific algorithms running on Apache Spark and GraphX. Purpose: Recognizing the lack of performance benchmarks demands ensuring accuracy through experimenting. Methods: This study will utilize the Kronecker Graph model to synthetically generate graphs given a seed graph. Both Veracity and Performance measurements will be taken of the experiments to ensure that the synthetic graph mirrors the structure of the seed graph and that the algorithm correctly scales across a cluster of computing nodes. The seed graph will consist of network data from the Swedish Defense Research Agency. Results: Synthetic Kronecker graphs of magnitudes larger than the original seed graph retained the properties of the seed graph accurately as the normalized Euclidian Distance between the graphs grew smaller as graph size increased. Also, the PageRank distribution grew smaller as graph size increased. This shows that when generating graphs smaller than the seed, the Kronecker algorithm does not have enough space to correctly match the properties of the seed graph. Generation time scaled linearly with the number of edges generated, showing that the implementation was able to achieve O(E) time complexity, where E is the number of edges. Also, Kronecker scaled well across the cluster since the speedup factor increased when adding new nodes to the compute cluster. Conclusion: Overall, the Kronecker graph generation algorithm scales well across a cluster and is able to produce large synthetic graphs that are highly accurate.

SS-09
Name, Major: McKenzie Chaney, Human Sciences/Human Dev & Family Studies
Project Title: *Social media addiction and self image*
Faculty Advisor, Department: Dr. Joe Wilmoth and Dr. Charles Freeman, School of Human Sciences
Project Type: Poster
Project Category: Social Sciences

Abstract: Are college students more likely to view themselves as pretty, successful, or popular due to the amount of likes, comments, views, or shares one gets? Based on peer's posts, students are comparing their image to others around them or on social media. According to research completed by Grabe, Ward, and Hyde, social media tends to portray thinner individuals than in the past, which are negatively impacting a young adults self-image. Many people suffer with bodily dissatisfaction as a result of self image being lowered. Because college students are spending more time on social media, even to the point of being addicted, they are seeing unrealistic expectations.This is leading them to feel like they have to live up to standards, which alters their self image. There is a gap in research with completing studies that focus on a specific age group. Therefore the purpose of this research study is to examine how the addictive use of social media relates to the self image of college students. Using likert scales on self-image from the third edition of the Marketing Scales Handbook and the Social Media Addiction Questionnaire (SMAQ), we will conduct research by giving a survey to students at Mississippi State University. The survey will pinpoint a correlation between social media addiction and body image. We hypothesize that social media addiction will have a negative influence on the self image of students at Mississippi State University.

AH-06
Name, Major: Carson Clark, Human Sciences/Apparel Textiles & Merchandising
Project Title: *1940s Cotton Lace Wedding Gown*
Faculty Advisor, Department: Lori Neuenfeldt and Charles Freeman**,** School of Human Sciences
Project Type: Poster
Project Category: Arts and Humanities

Abstract: The most important garment a woman will wear in her lifetime is her wedding gown. A wedding gown not only expresses a woman's individual personality and style, but can shine a light on her prominence and class. The 1940s was a time in fashion when women wanted the illusion of a thin waist and full hips. What we know about the 1940s wedding gown is that the gown is made entirely of cotton and has a simple yet elegant design with its sheer lace sleeves, fitted bodice, and A-line skirt. Delicate details include lace ruffles lining both the neckline and sleeves. Through an image donated along with the gown by Linda Cambre, we learned that the bride, Ellen Bryant, was marrying a man in the United States Air Force. The fitted bodice and A-line skirt were a very popular silhouette during the World War II era. However, what we don't know is who designed the gown. There are no labels inside the garment so we are unsure of who created the piece, and if it was a custom piece. We also have no information about the woman, or what her social status was. Therefore, the purpose of the case study is to discover who the designer of this particular wedding gown was, if it was custom, and what type of class the woman was in that wore this gown. We are going to discover this information through our resources we have in the historic costume archives at Mississippi State University. We can hypothesize that this wedding gown was worn by a woman that enjoyed comfort, but also had a sense of style. The long sleeves and conservative neckline perceive her to be a woman of class. We will continue research to confirm our hypotheses.

SS-10
Name, Major: Amanda Clark, Human Sciences/Human Development and Family Studies
Project Title: *The Application of Interrater Reliability within the Classroom*
Faculty Advisor, Department: Dr. Kay Brocato and Dr. Ashli Brown-Johnson, Counseling and Educational Psychology, Biochemistry
Project Type: Poster
Project Category: Social Sciences

Abstract: Analyzing qualitative data across more than one reference as a researcher or rater to ensure sound results requires a level of agreement and reliability. Interrater reliability guarantees that results are not biased or skewed because it is judged across multiple sources. This from of reliability is encountered in a variety of situations from Olympic ice skating judges to graders on standardized tests and relies on human observers maintaining a large degree of consistency. Therefore, the purpose of this study was to determine the rate at which interrater reliability can be achieved between expert raters and a novice rater. An initial set of writing samples from a college course were rated on a scale of 1 to 5 by both the expert raters and the novice rater to find a base level. More rating sessions followed this until interrater reliability was reached. Interrater reliability is useful because people will not always interpret results and answers in the same way. Even though raters may have differing opinions as to whether or not a certain skill or material is being demonstrated in an advantageous manner, this can be normalized to maintain consistency.

AH-07
Name, Major: Karmilya Cleggins, Human Sciences/Apparel Textiles and Merchandising
Project Title: *Historic Gown Research*
Faculty Advisor, Department: Neuenfeldt and Freeman**,** School of Human Sciences
Project Type: Performance
Project Category: Arts and Humanities

Abstract: Every dress serves a special purpose. Whether it's a ball or just every day wear, gowns have always been a vital part of any event. Women's every day gowns were very popular in the 16th century. In the early 1900s, two-piece everyday gowns were one of the most common dresses worn. One, in particular, was donated to the Historic Costume Collection at Mississippi State University. The donor is being researched but is unknown as of right now. After analyzing this entire garment thoroughly, it shows to be in a poor condition. It has several missing lace placements on the bottom of the skirt and a few brown stains from what looks like water damage. The fabric material used in this piece is predicted to be silk with a polyester blend. This gown is a beige/ dirty white color and gives off the idea that it has been treated or steamed with a wrinkle-resistance treatment. It has alternating lace detailing at the bottom of the dress and the top has a lace turtle neck and buttons up in the back. What is most interesting about this garment is the detailed lace placements on the skirt. There are flower shapes with in the lace. It will be very interesting to learn why multiple placements disappeared. This garment is typically worn with a petticoat to enhance the shape of the gown. It is presented that this type of gown is an ensemble worn by young woman. I chose to research this garment because 2- piece dresses are very popular in the 21st century and I thought it would be interesting to see how this type of garment was worn in the early 1900s. With continuous research, questions pertaining this garment will continue to be answered.

BSE-13
Name, Major: Jackson Coole, Biological Engineering
Project Title: *Computational Modeling Approach Offers Predictions into Mechanistic Properties of AGE/RAGE Signaling Cascade*
Faculty Advisor, Department: James A Stewart, Jr, Biological Sciences
Project Type: Poster
Project Category: Biological Sciences and Engineering
Other Categories: TRC

Abstract: Consuming environmental contaminants with a high, saturated fatty diet has been demonstrated to promote precursors for metabolic syndrome (hyperglycemia, hyperinsulinemia, and hypertriglyceridemia). In a previous study to determine if exposure to the most prevalent environmental persistent organic pollutants (POPs) would act as causative agents to promote metabolic syndrome independent of dietary intake, increased activation of the AGE/RAGE signaling cascade resulted in elevated levels of downstream markers for fibroblast differentiation, RAGE, and oxidative stress. POPs treatment increased protein levels of AGE/RAGE signaling outcomes in the diabetic animals. Conversely, ob/ob-POPs groups had decreased superoxide dismutase-1 and -2 (SOD-1 and SOD-2) expression than other groups. Reduction in SOD-1 and SOD-2 protein expression could exacerbate the adverse changes occurring as a result of POPs treatment. A computational model of the AGE/RAGE signaling cascade was created to study this reaction mechanistically using the MATLAB module Simbiology and methodology influenced by the current literature. The implementation of the interaction of ctRAGE with the FH1 domain of Diaphanous-1 indicates the dependence of RAC-1 activation for reactive oxygen species (ROS) formation. RAC-1 is a GTPase that behaves as a 'molecular switch' for NADPH oxidase, which converts molecular oxygen into superoxide (ROS). ROS is then converted into hydrogen peroxide (H2O2) by SOD. The combination of ROS upregulation from RAC-1 activation and the reduction of SOD-1 and SOD-2 protein expression from POPs exposure could exacerbate the negative effects of AGE/RAGE activation. The mechanism of RAC-1 activation is currently unknown and we hypothesize that it could pose as an ideal therapeutic target for future studies. Our next study aims to explore the mechanisms of RAC-1 activation through in vivo studies and to continuously update the computational model from future data in order to better understand the AGE/RAGE signaling cascade.

AH-08
Name, Major: Elizabeth Costa, Human Sciences/Apparel Textiles and Merchandising
Project Title: *Power Suit*
Faculty Advisor Name: Lori Neuenfeldt, FDM
Project Type: Poster
Project Category: Arts and Humanities

Abstract: The 1960s was one of the most important times in the women's movement, especially for workplace equality. This brown tweed Pendleton suit exemplifies how a woman would want to be taken as seriously as men in the workplace, with straight simple lines, a boxy silhouette, and a high collar. This suit also has many style elements that Jackie Kennedy embodied at the time, a collarless jacket and large buttons are key features to this suit. We know a lot about the specifics of the physical piece, however we aren't sure what type of woman wore this suit. Therefore it will be my goal for this case study to research who would have purchased this suit and why. What statement was this woman trying to make about herself while wearing this suit? With research of the time period as well as research of the Pendleton company itself I am hoping to discover information on socioeconomic class, age and place in society. I am hoping that my research will reveal a strong independent working woman and someone that potentially could have been involved in the women's movement.

SS-11
Name, Major: Michael Costa, Accounting
Project Title: *Are Banks' Changes In Held-To-Maturity Securities Related to Incoming Capital Requirements?*
Faculty Advisor, Department: Joseph Faello, Division of Business Meridian
Project Type: Poster
Project Category: Social Sciences
Other Categories: TRC

Abstract: Recent articles in the financial press have commented on banks’ holdings of debt investments. Banks can categorize these investments either as available-for-sale (AFS) or held-to-maturity (HTM) depending on their intentions. For HTM securities, banks should hold them until the maturity date. Whereas, for AFS securities banks may sell them prior to the maturity date. Shenn (2014) suggests that banks are increasing HTM securities to meet incoming capital requirements. Whereas, Janosky (2014) suggests banks maintain AFS securities to enable liquidity and financial flexibility. Prior research shows that banks react to changes in regulations or economic environment. For example Kim and Kross (1998) find that banks changed their loan loss provisions and write-offs in response to changes in the bank capital standards. On the other hand, Meder (2015) finds banks change HTM and AFS holdings in response to changes in monetary policy. The purpose of this study is to investigate whether changes in HTM securities are associated with more stringent capital requirements and banks’ liquidity. Results show that banks’ changes in HTM securities are not related to stringent capital requirements but is related to changes in liquidity. Overall, the relation between changes in HTM securities and liquidity suggest banks are responding to economic factors.

BSE-14
Name, Major: Kendria Cotton, Animal and Dairy Sciences
Project Title: *Influence of Velocity on the Weimaraner Stepping Gait Kinematics*
Faculty Advisor, Department: Dr. Molly Nicodemus, Animal and Dairy Sciences
Project Type: Poster
Project Category: Biological Sciences and Engineering

Abstract: One of the major health concerns of large dog breeds is hip dysplasia, a developmental orthopedic disease. Although the Weimaraner has a lower chance of hip dysplasia compared to other large breeds, research concerning how the Weimaraner moves is limited. Therefore, the objective of this study was to measure the kinematics of the Weimaraner stepping gait and determine the influence of velocity on the gait. Six American Kennel Club (AKC) registered Weimaraners were led at a slow and fast stepping gait. Ten consistent strides lacking suspension were filmed for each dog at each velocity. A computer was used to perform frame by frame analysis of the gait to help record data on left and right stride variables. Circular markers attached to the joint centers of the fore and hind limbs were used for limb tracking and determining joint displacements. Means (SD) were determined for stride variables and joint displacements and t-tests were performed between velocities ($P<0.05$). Stride duration decreased with increasing velocity (s=0.54+0.05 msec, f=0.40+0.02 msec; $P<0.05$) as stride length remained consistent (s=0.79+0.04 m, f=0.81+0.07 m; $P>0.05$). As velocity increased the primary support phase transitioned from a lateral bipedal (s=63+4%, f=35+3%; $P<0.05$) to a diagonal bipedal (s=26+2%, f=50+5%; $P<0.05$) support phase. The majority of stride was spent in the stance phase for both velocities (s= fore-50+1%, hind-61+3%; f= fore-58+2%, hind-58+4%), although the slower velocity demonstrated a significant difference between the fore and hind stand durations ($P<0.05$). While the range of motion in the carpal joint increased with increasing velocity (s=53.2+1.9 o, f=64.6+3.1o; $P<0.05$), the other joint displacements measured in both the fore and hind limbs remained consistent between velocities. In conclusion, while the Weimaraner stepping gait shared characteristics seen in a typical large breed walk, the mechanism for increasing velocity was unique to the breed.

SS-12
Name, Major: Haily Crawford**,** Psychology
Project Title: *Poor Strategy Selection by Students: Failure of Metacomprehension or Lack of Effort?*
Faculty Advisor, Department: Jarrod Moss, Psychology
Project Type: Poster
Project Category: Social Sciences

Abstract: Prior research shows that students generally do not choose to use effective study strategies, even after comparing performance between an effective and ineffective strategy (Tan & Eakin, in prep). One reason could be that students predict that ineffective strategies will produce better comprehension than effective strategies, resulting in a failure of metacomprehension. Most studies, however, compare an effective strategy that requires more effort, in terms of time, than the ineffective strategy to which it is compared. The result is that students could be basing their strategy selection on the effort required, rather than on its effectiveness at improving comprehension. In our study, we equated the amount of time required for the effective and ineffective study strategies. The time-matched effective strategy was delayed summarization, the time-matched ineffective strategy was recopying the text, and a lower effort ineffective strategy was rereading. Participants were in either one of two conditions: the time-matched effective and ineffective strategy or the effective strategy and the low-effort ineffective strategy. Participants practiced an ineffective strategy and an effective strategy, and they were then asked to choose which of the two strategies they wanted to use to study a new text. For each strategy, they read a text, used the strategy, predicted their comprehension, and then took a comprehension test. Although we anticipated that summarization would lead to better comprehension and comprehension monitoring, this was not always the case. There was an unanticipated order effect; after summarizing participants did better when using the ineffective strategy. Summarizing the first text may have led to better calibration of what to expect from the text and test such that comprehension monitoring was better on the text following the use of summarization. The current results highlight that assessing the effectiveness of a strategy for oneself may be more complex than originally anticipated.

SS-13
Name, Major: Jennifer Darce, Psychology
Project Title: *Outsmart the Test!*
Faculty Advisor, Department: Gary Bradshaw**,** Psychology
Project Type: Poster
Project Category: Social Sciences
Other Categories: TRC

Abstract: Multiple choice tests are commonly used to assess learning in higher education. Unfortunately, very little research has been done to evaluate the accuracy of such tests to measure learning. A study by Katz (1990) showed that students who answered questions from the Reading Comprehension task on the Scholastic Aptitude Test after reading the accompanying passage scored similarly to those who had not read the passage. Katz (2001) confirmed that students inflate their scores by using information from one multiple choice test question to answer another. Both studies suggest that multiple choice tests may not be an accurate reflection of learning. To examine the generality of these findings, a new experiment was conducted. The current study examines the accuracy of multiple choice tests by testing students on unfamiliar material using questions from a popular introductory psychology test bank. Questions that contained information helpful in answering other questions were excluded, and the order of questions was randomized to minimize the ability of students to use information on the test to improve their performance. Participants were undergraduates in introductory psychology classes. The average score was shown to be significantly greater than chance, but student performance varied widely. These results reveal that multiple choice tests overestimate learning, and professors should take this into consideration when employing questions from publishers' test banks.

PSE-05
Name, Major: Sarah Darrow, Computer Science
Project Title: *Tactile Sensing in a Therapeutic Robotic Dog*
Faculty Advisor, Department: Cindy Bethel, Computer Science
Project Type: Poster
Project Category: Physical Sciences and Engineering

Abstract: TherabotTM is a therapeutic assistive robotic dog that is intended to act as a support companion for people diagnosed with Post-Traumatic Stress and trauma-related disorders. The goal of this platform is to be used during supervised therapy sessions as well as in more frequent at-home exercises. The focus of this research effort is the development and evaluation of life-like and functional behaviors for this complex platform. In order for it to provide optimal support, it is important to understand how the humans using it will interact with it. To accomplish this, a network of sensors has been designed, developed, and implemented to record data to determine where, when, and how the user touches and interacts with this robotic therapy dog. This sensing system provides valuable information that can be used to classify and distinguish between different behaviors the patient may use when interacting with the robot, and incorporates machine learning and artificial intelligence techniques to improve the human-robot interaction. This data also helps to infer characteristics about the patient (e.g., what they like and dislike about the robot's behaviors) and it will be helpful in making decisions on how the robot should move along with other behaviors in order to exhibit more natural movements similar to a real dog naturally responding to interactions with a human.

AH-09
Name, Major: Daniel Davis, Forestry/Forest Management
Project Title: *The Impact of Mesophication on Upland Forest Floor Flammability*
Faculty Advisor, Department: Heather Alexander, Forest Ecology
Project Type: Poster
Project Category: Arts and Humanities

Abstract: In the eastern United States, upland oak forests are widespread, control ecosystem processes, and provide nutrient rich hard mast for wildlife. Fire suppression has contributed to a compositional shift from upland oaks (e.g., Quercus coccinea, Q. alba, Q. velutina) to fire sensitive species (e.g., American beech (Fagus grandifolia) and red maple (Acer rubrum)) which could potentially create cooler and moister forest conditions through a process known as mesophication. This conversion to more fire sensitive species could lead to less flammable fuels, which could subsequently alter future fire potential of these forests. In this study, we explore the impacts of mesophication and fire restoration on forest fuel characteristics across six different sites with different fire regimes (unburned controls, single burns, and multiple burns (2x)) within upland oak forests in northern Kentucky. We hypothesize increased prescribed fire events will lead to increased oak species litter, decreased fire sensitive species litter, as well as decreased fine woody fuels. To test this hypothesis, we collected leaf litter and duff within ten 30 cm x 30 cm quadrats located within each site. We also measured downed woody fuels (1, 10, 100, and 1000 hours) along planar intercept transects. Results will suggest how mesophication and fire restoration in upland oak forests are impacting forest flammability and fuel characteristics.

SS-14
Name, Major: Jane Alexandra Davis, Human Sciences/Human Development and Family Studies
Project Title: *Celebrity influence and social media*
Faculty Advisor, Department: Dr. Joe Wilmoth and Dr. Charles Freeman, School of Human Sciences
Project Type: Poster
Project Category: Social Sciences

Abstract: Social media is ideally a highlight reel of what is considered normal in society. It is one of the biggest tools used for self-expression. With this incorporation, body image plays a large factor in today's society. Starting at a young age, we look up to celebrities for beauty and fashion style ideas. With a heavy presence of celebrities and role models all over social media, there is an influence from teens based on self- perceptions and body image. By comparing two surveys, including the self-esteem survey and the survey on celebrities, the result may conclude that celebrities on social media is impacting teens in a more negative way than a positive way. The purpose of this study is to determine that the strong presence of social media in the world today emphasizes comparisons and dissatisfaction upon those who follow certain celebrities that they look up to as role models. For instance, when a teen sees a celebrity that they really look up to wearing a certain outfit or looking a certain way, it could potentially cause the teenager to think they will not be "good enough" unless they have that outfit or look that way. This could cause the teenagers level of self-esteem to depend on social media. The methodology, behind this research will be conducted as a survey that is based on the perception of celebrities and the impact on teen's body image and self-esteem. A survey will be sent out to teenagers ages 17 through 20 with questions for them to answer about this topic. Our hypothesis is that celebrities on social media have a negative impact on self-esteem of seventeen to twenty year olds. The research we obtained through our survey will potentially result in a negative impact on self-esteem of teenagers because of celebrities on social media.

BSE-15
Name, Major: Margaret Davis, Chemistry
Project Title: *Effects of direct exposure to DDE and trans-nonachlor on hepatocyte glucose metabolism*
Faculty Advisor, Department: George E. Howell III, PhD, Basic Sciences
Project Type: Poster
Project Category: Biological Sciences and Engineering

Abstract: "Effects of direct exposure to DDE and trans-nonachlor on hepatocyte glucose metabolism" Margaret Davis, Julie Holdridge, Sandeep Kondakala, and George Howell III Department of Basic Sciences, College of Veterinary Medicine, Mississippi State University, Mississippi State, MS 39762 Approximately 9.3% of the U.S. population is affected by type 2 diabetes mellitus, which is characterized by fasting hyperglycemia and insulin resistance. Late stages of the disease are also commonly associated with pancreatic problems. The primary defect in type 2 diabetes is insulin resistance which can impact hepatic glucose metabolism to contributes to increased blood glucose levels. While the etiology of type 2 diabetes is likely multifactorial, a link between diabetes and persistent organic pollutants (POPs) has recently gained attention. In our present study, the effects of two prevalent and highly implicated POPs, p,p'-dichlorodiphenyldichloroethylene (DDE) and trans-nonachlor, were studied in rat primary hepatocytes to evaluate effects of direct exposure on hepatic glucose metabolism. Concentrations of 2 μM and 20 μM of each POP were used to assess the effects on hepatocyte glucose production and uptake. The effects of trans-nonachlor (2 and 20 μM) on hepatocyte glycogen content were also explored. Exposure to both DDE (20 μM) and trans-nonachlor (2 and 20 μM) for 16 hours significantly decreased hepatocyte glucose production. However, this decrease in glucose production did not appear to be due to increased glycogenolysis as indicated by a lack of effect of trans-nonachlor exposure on hepatocyte glycogen content. Additionally, exposure to DDE or trans-nonachlor did not significantly alter hepatocyte glucose uptake. In summary, historic risk factors, including age, weight, and genetic predisposition, do not sufficiently explain the rising prevalence of type 2 diabetes. Environmental factors, including exposure to POPs and other environmental contaminants, are currently being studied in order to assess the degree to which they affect diabetes and the current data indicate direct exposure to POPs can alter hepatic glucose metabolism. However, the present data indicate they may promote hypoglycemia as opposed to hyperglycemia.

BSE-16
Name, Major: Nancy Davis, Animal and Dairy Sciences
Project Title: *Evaluation of a hair coat scoring system for winter growth and relationship to performance of Angus dams*
Faculty Advisor, Department: Trent Smith, Animal and Dairy Sciences
Project Type: Poster
Project Category: Biological Sciences and Engineering

Abstract: The objectives of this study were to determine the effectiveness of a visual hair scoring system for winter hair growth (WG) and winter length (WL) and evaluate the effect of each on performance of Angus females. Data were collected on Angus females (n=129) every other month from August to February in 2015-2016 and 2016-2017. Trained technicians observed animals for WG and WL and rated them 1 to 5 ("1" indicated no winter growth or short hair and a "5" indicated a full coat or long hair). Hair samples (5.08 cm X 10.16 cm) were clipped behind the left shoulder and weighed (hwt). Thermal images were taken of the clipped (avgshav) and unclipped area (avghair), along with rectal temperatures (rectal) and respiration rates (resp). Data were analyzed using the MIXED procedure in SAS with hwt, avgshav, avghair, rectal, and resp as response variables and included fixed effects of collection month, WG, WL, cow age, and BCS with ambient temperature used as a covariate. Collection month was significant for all response variables ($P < 0.05$). As WG score increased avghair temperatures decreased ($P < 0.05$). Also, rectal temperatures increased as WL scores increased ($P < 0.05$). For WG and WL, hwt increased as scores increased ($P < 0.05$). Calf birth weight was also measured and was analyzed as a trait of the dam. The model included birth weight (BWT) of the calf as the response variable with fixed effects of year, cow age, calf sex and WG or WL with sire as a random effect. WG and WL were not significant for BWT ($P > 0.05$). Results indicate validity of the visual method for determining hair growth but do not suggest an association between winter growth scores and performance of Angus dams.

AH-10
Name, Major: Ryan Denney, Aerospace Engineering
Project Title: *Evaluating the Effects of Design Basis Event Treatment on the Physical Properties of Nuclear Grade HEPA Filter Media*
Faculty Advisor, Department: Heejin Cho, Mechanical Engineering Department, ICET
Project Type: Poster
Project Category: Arts and Humanities

Abstract: The Institute for Clean Energy Technology (ICET) at Mississippi State Univeristy has been involved in evaluating the performance of AG-1 Nuclear Grade High Efficiency Particulate Air (HEPA) Filters under design basis conditions to better understand aerosol behavior and provide quality data to be used in filter design and development. To better understand the limitations of certain filter media types, a series of physical property tests was performed. These tests include measuring the tensile strength before and after various treatments, including Wet Over Pressure Test conditions and flooding events, performing a gravimetric analysis and calculating the grammage, and compressibility and recovery testing. Simulating environmental accident conditions that could potentially occur in a nuclear waste treatment facility and determining the filter media response to those conditions could lead to enhanced design of new media. The analytical data provided will be useful for manufacturers to use in development of new nuclear filters, which will increase public safety in the case of a natural disaster and protect the public from the harmful effects of radiation leaks from nuclear waste treatment facilities in the event of a natural disaster.

AH-11
Name, Major: Georg Detz, Landscape Architecture
Project Title: *Park 20/20: A Review of Sustainable Practices*
Faculty Advisor, Department: Cory Gallo, Landscape Architecture
Project Type: Poster
Project Category: Arts and Humanities

Abstract: Park 20/20 is a very unique, well known business park located near Amsterdam's Schiphol Airport in the Netherlands. Being built on a polder (land reclaimed from the sea) presented numerous challenges. The overall design of the project, was the collaboration of William McDonough and Partners, who specialize in architectural designs based on the Cradle to Cradle concept and Nelson Byrd Woltz, the landscape architect for the project. The overarching goal of Park 20/20, based on the Cradle to Cradle philosophy, was to create an all-encompassing system to benefit the environment for the locals, its economy and ecosystem, which consists of buildings of high density offices, hotel towers, athletic facilities, retail, and public open spaces. McDonough and Woltz wanted it to be a healthy and safe place for outdoor activities, work and relaxation. Park 20/20 holds many benefits to the environment as well as easy access for pedestrians and walkability, bicycles, buses, air and the railway system. It combines canal boardwalks, public gardens and green zones as well as urban plazas. For optimum energy efficiency, where buildings are situated, size and mass are calculated for greatest solar benefit. It is a platform based on the ideas of design for disassembly, productivity and health, business information modeling, and service products. With mixed usage, Park 20/20 also has a concept of integrated design and water/waste management.

BSE-17
Name, Major: Wellesley Dittmar, Biological Engineering
Project Title: *A system to identify gene products that alter airway hyper-responsiveness from -omics datasets*
Faculty Advisor, Department: Cyprianna Swiderski, Clinical Sciences
Project Type: Poster
Project Category: Biological Sciences and Engineering
Other Categories: TRC

Abstract: As a naturally occurring animal model of human asthma, equine asthma provides a unique platform to identify novel therapeutics that benefit both horses and humans. Airways from horses with equine asthma exhibit increased responses to airway spasmogens, a phenomenon termed airway hyper-responsiveness (AHR). To identify novel therapeutics for equine asthma, we employ RNA sequencing of lung tissue, selecting gene products that are uniquely regulated in diseased horses based upon their biological functions with the potential to modulate AHR. Using a tissue bath, the magnitude of AHR in isolated airways from lungs of horses known to have AHR (equine pasture asthma) and from non-diseased controls is quantified by measuring the contractile force generated during exposure to serially increasing doses of a spasmogen. Airways are suspended to force transducers in Kreb's Henselet solution (KHS) with carbogen insufflation at 37°C and direct stimulants of the acetylcholine receptor, such as carbachol, are commonly employed spasmogens. Exposure of airways from the same individual to serially increasing carbachol doses in the presence, or absence (controls), of agents that moderate a gene product of interest enables recognition of physiologic activity relevant to AHR for gene products lacking this a priori knowledge. Additionally, other spasmogens such as mannitol, serotonin, or antigens, which do not act via the acetylcholine receptor, can also be introduced into the system when indicated by the relevant biology of the gene product of interest. The underlying biology for this discovery system is presented. Consistent with AHR, airways from diseased horses demonstrated significantly increased carbachol sensitivity (1nM - 300uM) relative to non-diseased airways, and a characteristic left shift in the Δforce vs. [carbachol] curve of diseased relative to control airways (mixed model analysis, threshold $P < 0.05$). Of relevance, following storage in KHS in a conventional refrigerator (4°C) up to 24 h without carbogen, dose dependent carbachol responsiveness was preserved in isolated airway rings, but not in rings dissected from intact airways stored in this manner. This system provides a platform to identify the physiologic effects
of gene products segregating with equine AHR on airway caliber.

BSE-18
Name, Major: Gunnar Dunnam, Animal and Dairy Sciences
Project Title: *Additional exercise among grazing dairy cows and effects on uterine artery blood flow, milk production, and milk quality parameters*
Faculty Advisor, Department: Jamie Larson, Animal and Dairy Sciences
Project Type: Poster
Project Category: Biological Sciences and Engineering

Abstract: Cows in a dairy operation could be housed in barns or maintained on pastures. It is expected that grazing animals take more steps per day than those housed in confinement. The aim of this study was to determine if additional exercise in grazing, lactating dairy cows affected milk production, milk quality, and uterine artery blood flow during late gestation. On d 180 of their gestation, 17 Holstein cows in a grazing production system were randomly assigned to 1 of 2 treatment groups: an exercise group (WALK; n=9) which was walked an additional 5.6 km per d and a control group (CON; n=8) which was not walked more than normal. Cows were fitted with pedometers to record steps; data were collected daily. All animals were housed together on ryegrass pasture with a concentrate supplement. All animals were milked twice daily; milk yield was recorded at each milking, and milk samples (morning and afternoon) were collected on d 180 and 210 of gestation to evaluate milk composition. Ultrasound exams were conducted on d 180, 210, and 240 of gestation to measure heart rate and uterine artery blood flow. The MIXED procedure of SAS was used. Least-square means and pooled standard errors are reported. The number of steps taken were greater ($P \leq 0.0001$) between cows in the WALK group (7,212±208 steps per d) compared to the CON group (5,637±221 steps per d). The number of steps also differed ($P < 0.0001$) between d 210 and d 240 of gestation (7,317±166 and 5,532±166 steps per d, respectively). Treatment did not affect ($P > 0.05$) heart rate, total uterine artery blood flow, milk yield, concentrations of fat, protein, and lactose, somatic cell counts or milk urea nitrogen. In conclusion, added exercise during late gestation did not impact cardiac or milk measurements in this study.

SS-15
Name, Major: Ali Evans, Business Administration
Project Title: *A Generational Study on Spirituality and Depression*
Faculty Advisor, Department: Dr. Danielle Nadorff, Psychology
Project Type: Poster
Project Category: Social Sciences

Abstract: According to other studies, spirituality levels were found to be more prevalent among younger cohorts than older cohorts (Gay 2013), as were depressive symptoms (Twenge 2015). Generational differences in depressive symptoms and spirituality levels were examined within a sample of 273 adults who were raised by their grandparents or foster parents. Participants were grouped by generational cohort, into Millennials (aged 17-36), Generation X (aged 37-51), and Baby Boomers (aged 52-71). It was hypothesized that there would be significant differences between the generations concerning the two variables. Depressive symptoms were measured using the revised Center for Epidemiological Studies Depression Scale (CESD-R), and spirituality was assessed using the Stearns-McKinney Assessment of Religious Traits (SMART). Participants were recruited via an IRB-approved study utilizing Amazon's MTURK system. Results indicated significant generational differences in both depressive symptoms and spirituality, with older generations reporting higher levels of spirituality and lower levels of depressive symptoms in relation to the younger generation.

PSE-06
Name, Major: Nicholas Ezzell, Physics
Project Title: *Improving the Performance of Simulations of the Intrinsically Disordered N-Terminal Domain from p53*
Faculty Advisor, Department: Nicholas C. Fitzkee, Chemistry
Project Type: Poster
Project Category: Physical Sciences and Engineering

Abstract: Signal transduction in intrinsically disordered proteins (IDPs) is frequently understood in the context of binding-induced folding, but accurate simulations of IDP structures remain computationally challenging. Protein-solvent interactions, electrostatics, and prolyl isomerization all contribute to the complexity of the behavior of IDPs in solution. Previous studies have indicated a relationship between local alterations in Polyproline-II (PPII) propensities and hydrodynamic radius (Rh) which serves as an indicator of global structural changes. Unfortunately, extension of these studies to long polypeptide sequences is computationally prohibitive. We are interested in the behavior of the intrinsically disordered N-terminal domain (NTD) of the p53 protein, a 93-residue region involved in multiple protein binding and cell cycle control. IN previous work, accurate simulation of hydrodynamic properties has been limited to simple sequences of 50 residues or less, excluding the possibility of modeling the full length NTD. This study builds upon established computational methods to create a more efficient Monte-Carlo simulation of the NTD that retains the chemically-realistic solvation energy calculations employed previously. Our modified simulation is shown to reproduce faithfully the hydrodynamic properties of the NTD, while at the same time running significantly faster for polypeptides larger than 80 amino acids.

AH-12
Name, Major: Ty Faulkner, Civil Engineering
Project Title: *Review of Sustainable Practics at Stony Brook Millstone Center*
Faculty Advisor Name: Cory Gallo, Landscape Architecture
Project Type: Poster
Project Category: Arts and Humanities
Other Categories: TRC, Public Health

Abstract: When the Stony Brook Millstone Watershed Association was first established in 1949, it was the first environmental/research group in the state of New Jersey. The group consisted of environmental visionaries from the community that came together to help better the New Jersey environmental community. Their mission was to help protect the water and environment through conservation, science, and education. Over the years, their scope has not changed and they continue to protect and provide for the water and surrounding environment. Through conservation, advocacy, science and education, the Watershed center continues to improve and provide for the waters and environment of New Jersey. The Stony Brook Millstone Watershed Center functions as the core of all Watershed Association activities. Replacing the Buttinger Nature Center in December 2014, the Stony Brook Center became certified LEED Platinum from the U.S. Green Building Council (USGBC 2015). The new facility exercises sustainable methods with its minimal energy consumption and utilization of many sustainable technologies. Inside the center offers exhibits halls, classrooms, computer learning centers, conference rooms and a laboratory. These all serve to provide teaching and researching to increase the scope of their scientific and environmental endeavors, while reducing water and energy consumption. When it comes to sustainability, other buildings pale in comparison to The Stony Brook Millstone Watershed Center. Through its utilization of advanced sustainable technologies such as photovoltaic panels, solar hot water heating system and rainwater harvesting, the center provides most, if not all, of its own water and energy consumption needs.

BSE-19
Name, Major: Jennifer Fisher, Biological Engineering
Project Title: *Pan-Genomic Prescriptive of Corn Whorl Rot Pathogenesis*
Faculty Advisor, Department: Kurt C Showmaker, Institute for Genomics, Biocomputing & Biotechnology
Project Type: Poster
Project Category: Biological Sciences and Engineering

Abstract: In 2015, the B3R3 strain of Serratia macrcescens was identified as the causal agent corn whorl rot in China. This species of bacteria has also been found in several other environments such as; human tissues, insects, soil samples, and other diseased plants. The bacterium species shows a high degree of plasticity in its environment as well as the symbiotic relationships it forms. Most of the genetic research into the plant pathogenic strains of Serratia macrcescens has been conducted on the 16s rDNA region of the genome. In this study pan-genomics to identify potential virulence factors.

SS-16
Name, Major: Theresa Fitchie, Psychology
Project Title: *Suicidality and Depression of those Raised in Kincare*
Faculty Advisor, Department: Danielle Nadorff, Psychology
Project Type: Poster
Project Category: Social Sciences

Abstract: The rate of children who are raised in kincare, being raised by someone who is not the parent, has steadily been on the rise. Past studies have indicated that this particular group of individuals are at an increased risk of mental health problems, such as suicidality and depression, and are often at a financial disadvantage and overlooked for federal aid. The current study examines the suicidality and depressive symptoms of adults who were raised in kincare, compared to those raised by their biological parents. The participants were given the Suicide Behaviors Questionnaire revised (SBQ-R) to assess suicidality, the Beck Depression Inventory-II (BDI-II) to assess depressive symptoms, a single item assessing frequency of religious attendance, and a single item assessing socio-economic status. We found that both frequency of religious attendance and income were negatively associated with depressive symptoms. Similarly, they were both negatively correlated with suicidality, as well. Additionally, participants who were raised in kincare reported higher rates of suicidality than their peers. A significant relation between being raised in kincare and depressive symptoms was not found. Our findings suggest that this group of individuals may greatly benefit from increased federal financial aid, religious involvement, and suicide interventions.

BSE-20
Name, Major: Dylan Fleming, Biochemistry
Project Title: *Grasshoppers are Just Like Us: Stress and High Carb Diet Can Produce a Metabolic Response in Melanoplus femurrubrum*
Faculty Advisor, Department: James Stewart Jr., Biological Sciences
Project Type: Poster
Project Category: Biological Sciences and Engineering

Abstract: Post-traumatic stress disorder (PTSD) in humans can be caused by many different situations ranging from combat to sexual assault. The commonality between these experiences is the perception of a direct threat. People who suffer from PTSD are at a greater risk for developing a metabolic response, for example insulin resistance. While this idea of a link between stress and metabolic response is not unique to humans, a vertebrate system, it is a relatively new concept to an invertebrate system. Within the invertebrate system of the grasshopper Melanoplus femurrubrum, we are investigating whether a predatorial threat can induce a stressful experience resulting in a metabolic response. We accomplished this by exposing grasshoppers to varying situations which consisted of different food sources and predator scenarios. It was noticed that grasshoppers that consume a carbohydrate food source in the presence of a predator had increased glucose levels. In addition, there was an increase in extracellular signal-regulated kinases (ERK) in grasshoppers that consume carbohydrates compared to those who consume a protein based diet. These results suggest that both a carbohydrate food source and the presence of a spider can lead to changes in glucose and ERK levels, both of which can be associated with a metabolic response in vertebrates. This suggests that grasshoppers who are exposed to the stress of a predator and consume carbohydrates, could undergo a metabolic response. These initial results show a promising similarity between vertebrates and invertebrates in regards to metabolic response resulting from a stressful experience.

SS-17
Name, Major: Rob Fleming, Human Sciences/Human Development and Family Studies
Project Title: *Fashion trends and parent/child relationships*
Faculty Advisor, Department: Dr. Joe Wilmoth and Dr. Charles Freeman, School of Human Sciences
Project Type: Poster
Project Category: Social Sciences
Other Categories: Community Engagement

Abstract: Clothing choices have changed in various ways over the years. These changes have introduced new styles that people view and later begin to follow. Fashion trends are continuously changing; clothes that were viewed as scandalous or risqué 15 years ago, are now becoming more socially acceptable. Due to these changes, stress in relationships between parents and children may be present because of disagreements regarding clothing choices. These disagreements seem to be more associated with females and their parents, more so than males and their parents. Social media has also played a role in advertising specific trends, and the focus group tends to be millennials and younger. On average, young adults use social media or are online for over 40 hours a week. For many adolescents, that is more time than they spend with their parents, adding a significant influential factor in their life that their parents have trouble controlling. As we have seen in research, these disagreements over clothing choices can alter parent-child relationships positively or negatively. These different effects caused by the parent-child relationship and clothing choice are what make the research on this topic so important. As of now, we know that clothing trends influence parent-child relationships as well as family dynamics. We want to research this further: the connection between clothing trends and family relationships, and the outcomes that come from them. To find more information concerning this topic, we will conduct qualitative research by interviewing young adults and parents. We will ask them to reflect on their past or present experiences that relate to clothing choice and parenting. As we research this topic, we hope to discover the implications regarding clothing discourse among parent-child relationships.

BSE-21
Name, Major: Emerald Ford, Animal and Dairy Sciences
Project Title: *Characterization of Antifungal Activity of Endophytic Bacteria Associated with Soybean –Charcoal Rot*
Faculty Advisor, Department: Shien Lu, Biochemistry, Molecular Biology, Entomology and Plant Pathology
Project Type: Poster
Project Category: Biological Sciences and Engineering

Abstract: Characterization of Antifungal Activity of Endophytic Bacteria Associated with Soybean –Charcoal Rot Disease System Emerald Ford, Sonya M. Baird, and Shi-En Lu Department of Biochemistry, Molecular Biology, Entomology and Plant Pathology Charcoal rot in soybeans is caused by the fungal pathogen Macrophomina phaseolina which is a destructive and economically important soil-borne disease in the Southern United States. Since there are no fungicide controls for the disease, and the development of varietal resistance to this disease is not forthcoming, it is imperative to determine if biological control is possible. Culture-dependent microbial isolation revealed endophytic bacteria with significant antifungal activity against charcoal rot. Endophytic bacteria in soybeans have not been previously studied for use in control of charcoal rot disease. In preliminary studies, a few bacterial strains isolated from charcoal rot-associated soybean plants showed strong antifungal activities against the pathogen. These were found to belong in the bacterial genus Burkholderia. The objectives of this research are to identify the bacterial strains and characterize the genes associated with antifungal activity. PCR analysis using primers specific for Burkholderia and subsequent sequencing results confirmed that the bacterial strains are from the genus Burkholderia. Transposon mutagenesis resulted in two true mutants that lost their antifungal activity. The transposon insertions in the mutants were confirmed by PCR amplification of the transposon region and gel electrophoresis. Cloning to determine the disrupted gene sequences is underway. Findings from this research will provide insights to understanding the molecular mechanism associated with antifungal activity as well as provide a bacterial package for enhancement of soybean production.

SS-18
Name, Major: Mary Dade Ford, Human Sciences/Human Development and Family Studies
Project Title: *Impact of social media on apparel buying behavior*
Faculty Advisor, Department: Dr. Joe Wilmoth & Dr. Charles Freeman, School of Human Sciences
Project Type: Poster
Project Category: Social Sciences
Other Categories: Community Engagement

Abstract: This study will explore the impact of Deep South Pout's social media on female consumer shopping behavior. Research has shown that there are three different stages in the process of consumer decision-making: the input stage, the process stage, and the output stage. The input stage is when a customer sees a product advertised, the process stage is when the customer decides if they should purchase the product, and the output stage is when the customer goes and buys the product and decides if they are happy with their purchase. We will discover the application of these stages through research with Deep South Pout's social media. Previous studies have shown that social media influences young adults' behavior more than previous generations because of the importance for validation of self-image through popularity and fashion. We intend to answer the question of how much impact Deep South Pout's social media has on female consumer buying behavior. As part of the research plan, a survey will be distributed to frequent customers of Deep South Pout in order to discover the correlation between their social media and buying behaviors of their customers. We will then contact Deep South Pout and explain our research question to see if they would be willing to post our survey on their social media platforms. After our research has been concluded, we will share our findings with Deep South Pout so they may benefit from the research conducted.

BSE-22
Name, Major: Ruth Fowler, Physics
Project Title: *Molecular Identification of Fungi Using Molecular ITS (rDNA) Sequences for Rapid and Accurate Identifications for Ecological Studies, and Diagnostic Clinics for Human, Animal and Plant Pathogens*
Faculty Advisor, Department: Richard Baird, Entomology and Plant Pathology
Project Type: Poster
Project Category: Biological Sciences and Engineering

Abstract: The Kingdom Fungi consists of eukaryotic organisms, such as mushrooms and molds, which feed off of the decomposition of organic matter. These organisms can have a profound and detrimental impact upon forests, crops, and animals. For example, the fungus *Cryphonectria parasitica* drove the American chestnut to near extinction in the early 1900s, *Macrophomina phaseolina* is currently destroying Mississippi's sweet potato crop, and *Cryptococcus neoformans* causes meningitis in people with HIV/AIDS. Identification of fungi is necessary, but traditional taxa can be complex to non-experts, have poorly understood life cycles, and lack observable morphological characters. Thus, new methods involving genomic data were created. Advantages of molecular techniques include more rapid detection and identification of: slow growing organisms and nonviable organisms that are difficult to culture or cannot be cultured, without host tissues or animal models required. One method currently employed in identification of fungi is the use of specific primers with polymerase chain reaction (PCR) for comparison with sequence libraries of known fungi. Sequences are obtained from unknown fungi from the internal transcribed spacer (ITS) regions 1 and 2 located between the highly conserved rDNA subunit genes of fungi. The sequences are compared with a known library of sequences, such as the NIH genetic sequence database, GenBank. A study was conducted in Long-Term Ecological Research (LTER) National Science Foundation plots located in the Nantahala National Forest, North Carolina to determine the presence of important forest pathogens, symbiotic associations, and saprophytic microbes. These plots were sampled monthly for fleshy fungi in 2014-16, but identifications of dried stored material have yet to be confirmed by sequence data. The purpose of my study to edit the raw sequence data using electropherograms, define consensus sequences, and compare those to the GenBank database. From these microbial results, forest health taxa richness, diversity, and evenness will be determined.

BSE-23
Name, Major: Katy Franks, Biochemistry
Project Title: *Identification of Aspergillus flavus microRNA-like RNAs differentially expressed in maize lines with different levels of resistance/susceptibility to aflatoxin accumulation*
Faculty Advisor, Department: Din-Pow Ma, Biochemistry and Molecular Biology
Project Type: Poster
Project Category: Biological Sciences and Engineering

Abstract: Aspergillus flavus is a common pathogen that infects corn (Zea mays L) during pre-harvest and post-harvest stages. The infected corn produces aflatoxins B1 and B2, which can result in immunosuppression via aflatoxicosis in mammals if ingested. One of the strategies in reducing aflatoxin contamination is to breed maize lines with resistance to A. flavus. Several resistant maize inbred lines have been developed by Dr. Williams's group at USDA/ARS at Mississippi State. MicroRNAs (miRNAs) are a class of small non-protein coding RNA molecules found in many eukaryotic organisms, and they are involved in many developmental processes and play key roles in gene regulatory networks and varied biological processes. One hundred and thirty-five miRNA-like RNAs (milRNAs) have been identified in A. flavus via Illumina deep sequencing, and the expression of some of them were found to be correlated with aflatoxin production. In this research, the differentially expressed A. flavus milRNAs between the resistant (Mp719) and susceptible (Va35) maize lines will be identified by quantitative reverse transciption PCR (qRT-PCR). Small RNAs have been isolated from both maize lines inoculated with A. flavus NRRL 3357 which produces high levels of aflatoxin and will be subject to qRT-PCR analysis. This study will further our understanding of the molecular mechanisms governing maize resistance to A. flavus and aflatoxin accumulation. The identified differentially expressed milRNAs can be used as markers in the development of maize with enhanced resistance to aflatoxin accumulation.

BSE-24
Name, Major: Juliana Gardner, Agricultural Information Science
Project Title: *Substrates for asexual cutting propagation of Camellia Sinensis.*
Faculty Advisor, Department: Dr. Guihong Bi, Plant and Soil Sciences
Project Type: Poster
Project Category: Biological Sciences and Engineering

Abstract: Tea [Camellia sinensis (L.) Kuntze] is the world's most popular beverage second only to water. US market demands for tea increased from $1.8 billion in 1990 to $11.5 billion in 2015, and demands are met almost exclusively by importation. In Mississippi, currently we have two small--scaled tea growers located in Brookhaven and Poplarville. In addition, there are many other specialty crops growers (e.g., blueberry growers) who are interested in adding tea to diversify crop profile and improve profits. However, lack of research and extension support has left growers facing tremendous challenges in tea production. Internationally, asexual propagation has utilized native soil as a substrate. In the US the majority of propagation substrate is soilless. The objective of this research is to determine if commonly used soilless substrates can be used for tea plant propagation. Single node cuttings were stuck in either pine bark, 50:50 peat:perlite, expanding peat plug (Jiffy--7, Jiffy Products of America Inc., Lorain, OH), or peat composite plug (Preforma, Jiffy Products of America Inc., Lorain, OH). There were sixteen single--cutting subsamples per replication, and five replications per treatment, in a randomized complete block design. Three months after treatment initiation cuttings were removed from each substrate and roots washed. Data collected included root length, new shoot length, and rooting percentage. Root and shoot length data were analyzed using linear mixed models, and binary data were subjected to generalized linear mixed models with the binary distribution and logit link with the GLIMMIX procedure of SAS (version 9.4; SAS Institute Inc., Cary, NC). Cuttings stuck in peat:perlite and expanding peat plugs had significantly longer root length and higher rooting percentage than other treatments. There was no difference in shoot length for any treatments. 50:50 Peat:perlite and expanding peat plugs would be appropriate substrates for asexual propagation of C. sinensis.

AH-13
Name, Major: Fleshia Gillon, Human Sciences/Apparel Textiles and Merchandising
Project Title: *Silk Shatter*
Faculty Advisor, Department: Lori Neuenfeldt, Art, Gallery Director
Project Type: Poster
Project Category: Arts and Humanities
Other Categories: TRC

Abstract: Maintaining and preserving the MSU Historic Costume and Textiles Collection (HCTC) is dependent on understanding the material make-up and fabrication of the artifacts. Many of the garments that are most difficult to preserve are made from weighted silk. Silk is a protein fiber made by silk worms. Most fabrics are sold by the yard, but silk is sold by the weight. During the process of degumming the silk, one-fifth of the weight is lost. To replace the lost weight, metallic salts are added to the silk textile. Weight is important because it creates desired drape, which affects how it is priced. Silk weighting occurred mostly during the 19th century. Although luxurious, weighted silk suffers from self-destruction known as shatter. Shatter occurs where the metallic salts cut the fibers creating horizontal and/or vertical tears in the fabric. The purpose of this research project is to identify at-risk items and compile data to make recommendations related to the preservation of HCTC silk objects. Three items from the HCTC are visually identified as suffering from silk shatter. These items are a 1930s robe, a violet silk umbrella circa 1900, and embroidered ivory stockings circa 1920. Small samples from the stockings and robe were studied under an electron microscope. The microscopic images provided by Dr. John Guyton and Amanda Lawrence reveal the silk structure of the fibers and construction of the fabrics. Recommendations to store weighted silk items include keeping stress off the affected areas by storing them with acid-free padding or within other fabric filling the areas to avoid folds or creases. Although shattering is a sign of decay it is also a sign of the quality of the silk and denotes that the object is made from a once heavily weighted expensive silk.

SS-19
Name, Major: Janet Giron-Legarda, Psychology
Project Title: *Bullying for Position: Understanding Cyberbullying in High School*
Faculty Advisor, Department: Dr. Colleen Sinclair, Psychology
Project Type: Poster
Project Category: Social Sciences

Abstract: The results from Year One of the School Safety Initiative (N= 447 high school students) illuminated the dynamics of bullying in a local high school. This present study presents findings regarding cyberbullying, specifically. Cyberbullying is an increasingly common form of bullying, where the harassment of peers occurs via electronic means (such as through social media, text, or email). The national rate of cyberbullying is 7% over a school year (NCES, 2013). We found 25.9% of our student sample reported at least one instance of cyberbullying and 22.9% admitted to engaging in cyberbullying in the past 6 months. Further, students reported being both a victim and a perpetrator (39.2%) more often than being either victim (29.9%) or perpetrator (30.9%) alone. No gender differences were found in these rates. Cyberbullying seems to be an extension of other forms of bullying, in that those who reported being cyberbullied were more likely to report being victims and perpetrators of another form of bullying as well. Victims of cyberbullying also reported being victims of physical bullying (47.1%), verbal harassment (69.1%), and relational aggression (73.5%). Cyberbullying victims also reported being perpetrators of physical bullying (55.2%), verbal harassment (58.2%), and relational aggression (67.2%). Despite the alleged anonymity afforded by electronic communication, the majority of victims knew their aggressor(s). 43% of victims reported being cyberbullied by more than one aggressor. In fact, victims perceived their aggressor to be acting on behalf of a group in 85.3% of the reported instances, but often times the group targeting the victim were “friends” (49.3% members of same social group as bullies). In particular, cyberbullying was most common within the “popular” crowds. These results highlight cyberbullying as an extension of offline bullying within high status cliques. Thus may be a product of competition for status among both young men and women.

SS-20
Name, Major: Shea Gould, Agricultural Economics
Project Title: *A Coastal Habitat Production Function of Use to Policy-Makers*
Faculty Advisor, Department: Matthew Interis, Agricultural Economics
Project Type: Poster
Project Category: Social Sciences

Abstract: For more than a half-century, policy-makers, scientist, and economists have worked together to invest money and time into the United States Gulf Coast region. This region plays a significant role in both a business and environmental standpoint. In particular, with the Gulf Coast habitat provides habitat, natural protection against hurricanes and storms, spawning grounds for commercially important fish species, habitat for waterfowl, and numerous other natural amenities, the benefits are significant. Although this region obtains provides such benefits, the area is degrading at an exponential rate and policy-makers have been called upon to determine whether they should invest in Gulf Coast habitat restoration. With hundreds of thousands of acres degrading at a constant rate, policy-makers, scientists, and economists must work together to find the most beneficial and cost efficient way to restore the Gulf Coast. I used a liner regression analysis to examine how Average Annual Habitat Units (AAHUs), a numerical combination of quality and quantity of land, measure the quality of additional or restored habitat resulting from coastal restoration projects, changes based on several the dependent variables. These dependent variables include types of habitat, the specific water basin type, number of months of project construction, and total cost of construction adjusted to 2017 dollars. This research evaluated 123 habitat restoration projects along the Gulf Coast. The data on the projects come from the Coastal Wetlands Planning, Protection, and Restoration Act Project Lists. I find that for every million dollars spent, 11.62 AAHUs will be produced. Other variables whose parameters were significant include whether the project has been completed, duration of habitat construction, and project and basin types. The results from this project will be useful to policymakers to be able to make well-informed decisions on how to best restore US Gulf Coastal Habitat given a limited amount of resources.

PSE-07
Name, Major: James Grafe, Civil Engineering
Project Title: *Catalpa Creek Suspended Sediments and Water Quality Monitoring*
Faculty Advisor, Department: John J. Ramirez-Avila, Civil and Environmental Engineering
Project Type: Poster
Project Category: Physical Sciences and Engineering
Other Categories: TRC

Abstract: Suspended sediments are a main source of pollution in small watersheds. Catalpa Creek is located on Mississippi State University's campus, and suspended sediments are a significant source of concern along the span of the water way. Catalpa Creek receives runoff from multiple sources including: the main campus for Mississippi State University, agricultural and livestock fields, construction sites, residential neighborhoods, and roadways. Another contributing factor to the suspended sediments are the eroding stream banks. The purpose of this monitoring is to evaluate the main channel and tributaries of Catalpa Creek. This includes temporal and spatial variation of flow and water quality conditions throughout the stream. A team of students collected water samples which are analyzed with suspended sediments filtration, dissolved phosphorus filtration, and total phosphorus digestion. The students also collected water quality data using a Yellow Springs Instrument Sonde which provides temperature, specific conductivity, pH, and dissolved oxygen concentration. A Sontek flow tracker is also used to determine the flow velocity through the channel, the depth of the channel, and the width of the water flowing through the channel. Samples and data are collected at 15 different monitoring stations along the length of Catalpa Creek and at each tributary to the creek. The results obtained will indicated the severity of the erosion and sediment transport occurring in Catalpa Creek, and will show how imperative proper erosion and sedimentation control countermeasures are necessary.

AH-14
Name, Major: Danielle Griffin, Landscape Architecture
Project Title: *Portland Pearl District Park System Sustainability Literature Review*
Faculty Advisor, Department: Cory Gallo, Sustainable Communities
Project Type: Poster
Project Category: Arts and Humanities

Abstract: When considering the sustainability of an urban park, one must consider its placement within the greater network of parks throughout a city. In an urban environment, a singular park is not capable of providing every amenity and function that would characterize it as being "Sustainable." Therefore, we chose to investigate three parks that sit within the Pearl District of Portland, Oregon, in the hopes of revealing whether collectively their impacts could be considered Sustainable - with each one uniquely providing what the others could not. The three parks we chose to review were Jamison Square Park, Tanner Springs Park, and The Fields Park. We evaluated each park to examine them in relationship to their Social, Economic, and Environmental Sustainability. These parks are no more than two blocks from one other and are connected by NW 11th and NW 10th Avenues. They are each approximately one acre in size and have unique amenities which help serve the needs of the residents.

AH-15
Name, Major: Jacamria Gunn, Human Sciences/Apparel Textiles and Merchandising
Project Title: *1960s Plaid Dress*
Faculty Advisor, Department: Juyoung Lee, Apparel Textiles and Merchandising
Project Type: Poster
Project Category: Arts and Humanities

Abstract: Women's fashion in 1960s incorporated attitude and transitioned from modest to more revealing. This particular garment – a plaid short sleeve dress paired with a jacket is the perfect attire to showcase what fashion appeared to be within that decade. The dress features a fitted bodice, with hemline above the knee which was popular during this period. The colors of this garment are red and pink. The dress has pleats within the front and style lines. The matching jacket also has style lines, and two small pockets with gold buttons. However, there are not any labels within the garment to know the designer or year it was created. Therefore, the purpose of this study is to discover as much information about the garment as possible. Researching fashion that was trending during the 60s is likely to give more insight on this particular two piece outfit.

SS-21
Name, Major: Mallory Hancock, Educational Psychology
Project Title: *The Mother's Role in Avoiding Homework Stress*
Faculty Advisor, Department: Kasia Gallo, Counseling, Educational Psychology, and Foundations
Project Type: Poster
Project Category: Social Sciences

Abstract: Homework is frequently associated with stress and anxiety for students, and the parents who help. This literature review analyzes fifteen empirical articles in pursuit of determining specific stressors as well as offer suggestions to parents. The social learning theory is consistently present in research on homework stress. Self-efficacy of mother and child affect stress and anxiety levels during homework completion. Vygotsky's zone of proximal development and scaffolding techniques are suggested to assist parents in helping their children in productive ways. Individual differences are key components in research on homework stress. Family dynamics vary greatly among homes, so homework completion is different in each family. Research suggests that strong bonds between mother and child and emotion management are successful aspects of homework situations with lower stress and anxiety levels. Critics of homework assignments assert that it should be given only as a means of improving student learning, and not assigned out of habit. The enduring nature of homework carries with it stress and anxiety that varies with the degree of value placed on assignments. Educators should maintain an awareness of importance when assigning work. If homework does not benefit a child's learning, teachers could be contributing to the growing issues of stress, anxiety, and depression in society.

PSE-08
Name, Major: Alice Hanson, Chemistry
Project Title: *Promoting Agricultural Stewardship Through Identification of Synthetic Auxins in Cotton*
Faculty Advisor, Department: Dr. Ashli Brown, Biochemistry
Project Type: Poster
Project Category: Physical Sciences and Engineering

Abstract: Recently, varieties of soybean and cotton have been developed to be resistant to the synthetic auxin herbicides 2,4-dichlorophenoxyacetic acid (2,4-D) and dicamba. Using these herbicide tolerant crops will have benefits for farmers, such as improved yield, greater profitability, and additional control options for resistant weeds. However, 2,4-D and dicamba are volatile herbicides that can be damaging to nontolerant crops, which can become an issue during instances of off-target movement and application tank contamination. To combat these issues, new formulations were developed and released as 2,4-D Choline and dicamba-BAPMA. Current testing methods at the Mississippi State Chemical Laboratory (MSCL) have a difficult time differentiating between functional groups (amine, ester, or choline, etc.) of the different herbicides formulations. It is necessary to distinguish between the traditional more volatile formulations and less volatile herbicides in order to promote good product stewardship. This study will explore the possibility of using FT-IR technology to identify the presence of functional groups in affected cotton samples, which would therefore identify the presence of specific 2,4-D formulations. Three different formulations of 2,4-D (Weedone LV4, Unison, 2,4-D Choline) were separately applied to cotton plants, with Roundup being used as a control. Using Principal Component Analysis and Linear Discriminant Analysis, we were able to group and identify the various formulations of 2,4-D three days after application.

SS-22
Name, Major: Shaquela Hargrove, Psychology
Project Title: *Acceptance of Marginalized Couples*
Faculty Advisor, Department: Dr. Kristina Hood, Psychology
Project Type: Poster
Project Category: Social Sciences

Abstract: Marginalized couples, or those that are viewed by society as dissimilar from the socialized standard (e.g., same race/ethnicity, heterosexual couples), includes interracial/interethnic couples and same-sex couples (Lehmiller & Agnew, 2006). 13% of the U.S. population disapprove of interracial/interethnic couples while 45% don't approve of same-sex couples, and typically men are those disapproving (Newport, 2013; Changing Attitudes on Gay Marriage, 2015). Those who approve of interracial/interethnic couples tend to be men, non-white, and more politically liberal (Perry, 2013a; Yancey, 2002; Eastwick, 2009; Johnson, 2005). For Lesbian, Gay, and Bisexual couples (LGB), women, non- White and non-Republicans were more accepting (Perry, 2013b; Horn, 2007). Haider-Markel & Joslyn (2005) found similar factors in people who disapprove of marginalized couples such as being non-White, conservative, and religious. This research sought to discover the personal characteristics associated with acceptance of one type of relationship over another and to determine if acceptance of one could predict acceptance of the other. Data were collected from 186 students from a southeastern university. To assess for attitudes toward interracial/interethnic couples, the Attitudes toward Interracial Marriage Scale (reliability = .96) (Moran, 2014). The Index of Attitudes Toward Homosexuality (IOATH; Fisher, Davis, Yarber & Davis, 2011). A bivariate correlation demonstrated that gender ($p = .002$), religiosity ($p < .001$), and liberalism/conservatism ($p < .001$) were significantly correlated with attitudes towards homosexuality but only gender ($p = .008$) and liberalism/conservatism ($p < .001$) were significantly related to acceptance of interracial/interethnic couples. A linear regression found that less acceptance of LGB couples predicted less acceptance of interracial/interethnic couples $B = -.615$, $t(185) = -10.569$, $p < .001$.This demonstrates a need to research the acceptance of these couples because it strengthens a connection between acceptance of two marginalized couples. Educating people on effects of perceived stigma could lead to programs that promote equality.

AH-16
Name, Major: Erin Hartfield, Human Sciences/Apparel Textiles and Merchandising
Project Title: *Microbial Sweet Potato Leather*
Faculty Advisor, Department: Dr. Charles Freeman, Human Science/Apparel Textile and Merchandising
Project Type: Poster
Project Category: Arts and Humanities
Other Categories: Community Engagement, TRC

Abstract: Last year during the Sweet Potato Innovation challenge we manufactured a recipe using culled sweet potatoes and other natural ingredients to create a sustainable, bio-degradable, eco-friendly textile. What we know at this stage is that it is a sturdy material that has all the typical aesthetic characteristics as a faux leather and that it can be easily cut and sewn for use as a textile. We also know that it is very absorbent and takes natural dyes well. Entering the second phase of our research, we are testing our product to identify its attributes. Through crocking we will be able to determine how much color will be transferred through abrasion. The elongation testing will help us to determine its stretch or lengthening quality before tearing. Along with elongation, determining its tensile strength will identify a specific weight before the textile tears or breaks.We are confident that we will be pleased with the results of the crocking, elongation, and tensile strength testing. We expect to spend the majority of our time making our product hydrophobic. One product development challenge we have identified is the extended amount of time that it takes for our material to grow. Finding ways to reduce this process could result in a greater amount of material developed. In addition to what we have accomplished, we are not certain to what extent our leather compares to faux leather or real leather. So with that in mind another challenge that we face is how we want to market our product. We can explore many different aspects such apparel, first aid, or upholstery. In moving forward with testing we are confident that we will answer our questions and overcome any challenges that we may face.

BSE-25
Name, Major: Bethany Haynes, Animal and Dairy Sciences
Project Title: *Epigenetic Control of Male Fertility through Sperm Histone 4*
Faculty Advisor, Department: Erdogan Memili, Animal and Dairy Sciences
Project Type: Poster
Project Category: Biological Sciences and Engineering
Other Categories: TRC, Public Health

Abstract: Mammalian spermatozoa contain nuclear proteins, which include the Histone 4 (H4) whose functions, expression levels, and post-translational modifications are not well studied. This gap in the knowledge base is important because enhancing the fundamental science of the mammalian male gamete could further reproductive biotechnologies and treatments of infertility. The objectives of this study were to determine sperm H4's conservation and diversification, ascertain its networks and interactomes, and determine the expression levels of H4 and acetylated H4 in sperm from Holstein bulls with different fertility. To accomplish these objectives the first experiment included collecting bioinformatics on 15 mammalian species and aligning their sequences through ClustalOmega. Domains H4 sequences and gene ontology prediction terms were generated via InterProScan. The second experiment was aimed at ascertaining the networks and pathways of bovine H4 with Cytoscape 3.4.0. The objective of the third experiment was to utilize Flow Cytometry and Immunocytochemistry to quantify H4 and acetylated H4 in the sperm from Holstein bulls with varying fertility. We demonstrated that the amino acid sequences of H4 were completely conserved across the 15 mammalian species (100%). The nucleotide Complete DNA Sequences were highly conserved (77.88-91.35%), as were the non-coding mRNA nucleotide sequences (71.24-97.07%). In addition, the two domains discovered in H4 were the histone-fold domain and TATA box binding associated factor (TAF) domain. These findings are significant because H4's roles in development, nucleosome remodeling, and where it performs these functions help advance fundamental science and are applicable to evaluating semen quality, predicting bull fertility, and enhancing mammalian fertility.

AH-17
Name, Major: Zachary Henry, Architecture
Project Title: *Ecological Functionalism in the Work of Glenn Murcutt: A Case Study of the Fredericks-White House*
Faculty Advisor Name: Emily McGlohn, AIA, NCARB, LEED AP, School of Architecture
Project Type: Poster
Project Category: Arts and Humanities
Other Categories: TRC, Public Health

Abstract: The world is in an environmental crisis. Architects have the duty to save the natural environment through responsible and site sensitive design work. Through the ideals derived from regional, ecological, and cultural ties, Ecological Functionalism guides an architect to design a building that responds directly to the environment in which it is placed. To explore this, the author traveled to Australia during 2016 to interview internationally recognized architect Glenn Murcutt and to analyze his projects. This research is a case study of the Fredericks – White House. A close examination and comparison of collected information will demonstrate how Ecological Functionalism can help reduce the emissions that are destroying our environment.

BSE-26
Name, Major: David Herz, Biological Engineering
Project Title: *Investigations into the hybridization of Grand Cayman Blue Iguana (Cyclura lewisi) founders.*
Faculty Advisor, Department: Mark Welch, Biological Sciences
Project Type: Poster
Project Category: Biological Sciences and Engineering

Abstract: Hybridization poses a major threat to the genetic distinctness of rare species, sometimes leading to hybrid swarms and local extinctions. *Cyclura lewisi*, also known as the Grand Cayman Blue Iguana, is an endangered species endemic to the island of Grand Cayman. Blue iguanas face many threats due to human activities, including introduced predators such as feral cats and dogs, as well as environmental stresses, such as habitat loss and road traffic. Recent conservation efforts have helped the population rebound to almost 500 mature individuals. Unfortunately, there is reason to suspect that historical hybrid introgression with Cuban Iguanas (*Cyclura nubila nubila)*, and Sister Isles Rock Iguanas (*Cyclura nubila caymanensis*) could have occurred among founders. To mitigate future loss of genetic viability, it is important to assess the severity of hybridization in these founding individuals and the genetic integrity of the current breeding population. Genetic distinctness of an individual is determined through a combination of mitochondrial sequence variation and microsatellite analysis. Twenty microsatellite loci were genotyped using PCR based methods, and a mitochondrial region commonly used for the molecular systematics of iguanas was sequenced for the 78 founder individuals that were used for captive breeding to reestablish a wild population. Preliminary analysis of mitochondrial sequence variation with known haplotypes is not consistent with hybridization. Future analyses using this data will be used to answer questions regarding the potential for multiple paternity, relatedness of the founders, genetic variability, and inbreeding depression of the current Blue Iguana population.

AH-18
Name, Major: Meredith Hilliard, English
Project Title: *Linguistic Violence and Virility: Spanish Language Use and the Linguistic Construction of Power in Junot Díaz's The Brief Wondrous Life of Oscar Wao*
Faculty Advisor, Department: Kelly Marsh, English
Project Type: Talk
Project Category: Arts and Humanities

Abstract: In The Brief Wondrous Life of Oscar Wao by Junot Díaz, one of the most challenging and unusual aspects of the text is its frequent alternation between English and Spanish and its heavy use of esoteric allusions to sci-fi novels, TV shows, or movies from popular culture. As well as giving the text its unique cultural character, the multiplicity of languages in the book is also one of the work's most important aspects, demanding an expansion of the concept of language learning and the immigrant experience, and provoking a reexamination of the role of language in the subalternization or "othering" of groups of people. Díaz's incorporation of the Spanish language in Oscar Wao is fundamental to the work's commentary on the hegemonic power of language to "other" and obscure the histories and identities of marginalized groups. Through an analysis of the use of the Spanish language in the text, I will argue that the Spanish-English code-switching in Oscar Wao is structured to interfere with the flow of the predominantly English text and subvert it, while simultaneously acknowledging the status of Spanish as the secondary language of the work. I will then connect this idea to Yunior's own use of Spanish as a way of asserting his Dominican identity through his masculinity and his marginalization of Oscar through linguistic hegemony.

BSE-27
Name, Major: Hunter Holder, Computer Science
Project Title: *The Mitochondrial Genome of Mycosphaerella dearnessii*
Faculty Advisor, Department: Kurt Showmaker, Agricultural Genome Research
Project Type: Poster
Project Category: Biological Sciences and Engineering

Abstract: Mycosphaerella dearnessii is a pathogenic fungus which causes the disease brown-spot needle blight. This disease causes the growth of certain longleaf pine species to be stunted. M.dearnessii can be found in certain parts of North America, western and eastern Europe, and eastern Asia, and southern Africa, that makes it a fairly widespread disease and a good subject to research. The research presented here includes the raw sequence processing, assembly, and analysis of the M. dearnessii mitochondria genome sequence. The analysis included a comparison to a previously assembled mitochondria genome sequence from the wheat pathogen Mycosphaerella graminicola mitochondria that causes a leaf blotch symptom on wheat. The comparison of M. dearnessii and M. graminicola mitochondria was conducted for the purpose of helping to determine the relatedness of the two species for future M. dearnessii research.

SS-23
Name, Major: Anne Bratton Horn, Human Sciences/Human Development and Family Studies
Project Title: *Effects of self-esteem on clothing preference and purchase intention*
Faculty Advisor, Department: Dr. Joe Wilmoth & Dr. Charles Freeman, School of Human Sciences
Project Type: Poster
Project Category: Social Sciences

Abstract: The goal of our research is to build on previous findings and understand the relationship between overall self-esteem effects of clothing preference and purchase intention among college students, ages 19-22, at Mississippi State University. We are interested in how self-esteem influences the intentions behind clothing purchases. Clothing affects social interactions, interpersonal influence, and even cognitive functioning. Self-esteem is a person's overall sense of self-worth or personal value, and is fundamental to an individual's development. Based on previous research findings, we can assume that there is an existing correlation that indicates how clothing affects one's perception of themself. Clothes can affect one's health, mood, success, and overall self-confidence, and they influence how others perceive and respond to you (O'Callaghan, 2014). Research indicates that clothing plays a specific role in self-esteem, and many people view dressing up as a sign of respect and a way to boost self-esteem. Although clothing can empower, motivate, and affect the influence we have on others, we currently do not know how clothing preferences relate to student's self-esteem, specifically at MSU. Research lacks in linking the purchasing intention to self-esteem for MSU students. We will gather data on MSU students' through survey tests. We will use the Rosenberg Self-Esteem Scale to obtain an overall quantifiable measure of self-esteem and survey questions to measure students' purchasing intentions of specific items. Before researching, we can assume that high self-esteem contributes to less purchasing intention and low self-esteem contributes to more purchasing intention. We will be researching to determine the self-esteem effects of clothing preferences, and how this affects purchasing intention of college students at MSU. Through collecting survey data, results will indicate the correlation between purchasing intention for specific clothing items and self-esteem for students at MSU.

AH-19
Name, Major: Kelsey Horn, English
Project Title: *The Ghostly Presence of Female Voices in Mary Shelley's Frankenstein*
Faculty Advisor, Department: Andrea Spain, English
Project Type: Talk
Project Category: Arts and Humanities

Abstract: The Ghostly Presence of Female Voices in Mary Shelley's Frankenstein The female voice and representation is completely suppressed by male domination in Mary Shelley's Frankenstein. Male narration from Victor Frankenstein and his monster persist as a major factor in the suppression of what, the feminist theorist, Hélène Cixous calls "the feminine." The female voice is presented in letters from Elizabeth Lavenza, but other than these few letters the audience would be limited to only the view of men or the monster. Everything else about these two females was given from the perspective of men; this would be the victimization of the women in Frankenstein. Representation as women of how each saw themselves does not appear to come through the text either. The oppression of women's voices among relationships in Frankenstein leads to dangerous and even deadly situations for characters, such as Elizabeth and the female monster, since men only listen to what Cixous refers to as the "masculine." Furthermore, even the men with the best intentions placed on women tend to ignore and suppress the individual that presumably holds happiness for each man. Furthermore, I argue that this suppression of women's voices in this work displays fear and hate for the "feminine." Victor fears the power of a female monster to reproduce, and the monster hates the happiness that Elizabeth has given to Victor. Hate for female or what is considered "feminine" creates death and destruction for the people and beings of this work. Implications of the suppression of "feminine" in this text may lead to the belief that male narration and male dominance of representation allows for a blocking of ecriture feminine or the concept of feminine writing.

BSE-28
Name, Major: Addison Hoven, Wildlife and Fisheries Science/Wildlife Science
Project Title: *Physiological parameters as a potential indicator of reproductive status in Ambystoma tigrinum*
Faculty Advisor, Department: Carrie K. Vance, Biochemistry, Entomology and Plant Pathology
Project Type: Poster
Project Category: Biological Sciences and Engineering

Abstract: Physiological parameters as a potential indicator of reproductive status in Ambystoma tigrinum 1Addison A. Hoven, 2Allison R. Julien and 3Carrie K. Vance Departments of 1 Wildlife, Fisheries, and Aquaculture, 2,3Biochemistry, Molecular Biology, Entomology & Plant Pathology, Mississippi State University, Mississippi State, MS, 39762 USA The amphibian extinction crisis is continuing at an accelerating rate, increasing the need for salamander breeding and conservation. By using the tiger salamander (Ambystoma tigrinum) as a model for endangered species we can find better solutions to reproducing salamanders in captivity. Two salamander populations were observed, a younger, reproductive population and an older population with decreasing reproductive capabilities. By taking physiological parameters of both sexes within populations and ultrasounds to depict follicular development of females, the correlation between physiology and reproductive status could be determined. The objective of this study was to determine any correlations between physiological parameters and reproductive status within A. tigrinum. The weight in grams was taken of each individual in both populations. Then with a caliper, the length from snout to the cloaca, the girth, the cloaca width, and cloaca length were measured. After collecting physiological measurements, ultrasounds were performed to determine follicular development within females. Males in the younger populations weighed significantly less (49.89±2.99g) than the males in the older population (71.06±0.75g); $t(17)=4.96$, $p=0.00012$. Females within younger populations also weighed significantly less (42.88±3.01g) than the older female population (70.93±3.69); $t(20)=6.00$,$p<0.00001$. Both males and females in the younger population were smaller in length, cloaca length, cloaca width, and girth than those of the older population. Follicular development in females significantly differed between the two populations with the younger population having significantly more developed follicles than the older population ($p=0.047$). This study therefore reveals a potential correlation between physiological measurements and fertility, though more tests are needed.

BSE-29
Name, Major: Kristen Hubbard, Chemical Engineering
Project Title: *Polydimethylsiloxane Fabrication for In Vitro Modeling*
Faculty Advisor, Department: Renita Horton, Biomedical Engineering
Project Type: Poster
Project Category: Biological Sciences and Engineering

Abstract: In vitro models are helpful tools used to investigate cellular behavior under physiological and pathophysiological conditions. Challenges lie in effectively mimicking the in vivo system in a dish. Model characteristics such as material properties, cellular composition, and biochemical factors must be considered to effectively recapitulate features of the native environment. Microenviromental factors such as mechanotransductive cues and paracrine signaling can influence cellular behavior. Studies have shown that modulations in the mechanical stiffness of a material can drive cells to differentiate towards a specific lineage or cause cells to take on a disease phenotype. In this study, we will mechanically test various formulations of polydimethylsiloxane (PDMS) with the goal of matching the mechanical properties of native tissue. PDMS is biocompatible and can undergo surface treatment to support cell adhesion. We hypothesize that by altering mechanotransductive cues between cells and surface modified PDMS we can tune cellular responses. Further, using this mechanically tunable platform, we will culture cells and examine their response to chemical and mechanical stimulation.

AH-20
Name, Major: James Hugh, Landscape Architecture
Project Title: *Omega Center for Sustainable Living*
Faculty Advisor, Department: Cory Gallo, Landscape Architecture
Project Type: Poster
Project Category: Arts and Humanities

Abstract: The Omega Center for Sustainable Living is nationally renowned site, well-known for its sustainable waste-water treatment facility and clean energy practices. The Omega Institute uses these natural methods to serve its visitors as well as the local community by educating them on the steps taken to achieve a sustainable design. As well as several other awards, the Omega Center was the first project in the nation to receive 'Living' status in the Living Building Challenge, as well as LEED Platinum certification. The methods practiced at the Omega Center for Sustainable Living serve as great examples for ways we can make differences in our community in an attempt to make advancements toward more sustainable living.

BSE-30
Name, Major: Rebecca Humphrey, Animal and Dairy Sciences
Project Title: *The carcass characteristic shift in the compensatorily-gained pigs produced from feeding a methionine-deficient diet*
Faculty Advisor, Department: Shengfa Liao, Animal and Dairy Sciences
Project Type: Poster
Project Category: Biological Sciences and Engineering

Abstract: Compensatory gain describes the increased average daily gain seen in realimented animals following a nutrient restriction period. Methionine (Met) is the second limiting amino acid in typical swine diets. The objectives of this study were to see (1) if a Met-deficient diet can cause growth retardation in growing pigs, (2) if realimentation can yield compensatory gain in the pre-Met-deficient pigs, and (3) if there are any differences in carcass characteristics between the pre-Met-deficient pigs and their counterparts. Twenty crossbred barrows were individually penned and randomly allotted to two dietary treatments (n=10). One Met-deficient (D1) and one Met-adequate (D2) diet was formulated based on corn and soybean meal (NRC, 2012) and fed to respective pigs for 31 days. After that, all pigs were fed the same non-nutrient-deficient commercial growing-finishing diets until market weight, and then they were harvested in a meat laboratory and carcass characteristics measured. The D1 and D2 pigs began with similar body weights (23.5 vs. 23.6 kg; P=0.935), but after 31-day dietary treatments, the D1 pigs were lighter than the D2 pigs (51.6 vs. 55.0 kg; P=0.102). After realimentation for 55~62 days, the D1 and D2 pigs ended with similar body weights (122.7 vs. 122.6 kg; P=0.989). In terms of carcass characteristics, however, D1 pigs had thicker backfat (at 10^{th} rib; 2.95 vs. 2.51 cm; P=0.015), heavier belly weight (11.0 vs. 9.6 kg; P=0.005), lighter ham weights (untrimmed: 20.8 vs. 21.6 kg; P=0.043; trimmed: 19.6 vs. 20.6 kg; P=0.016), lighter picnic weight (8.72 vs. 9.80 kg; P=0.041), lighter total lean cut weight (51.8 vs. 53.8 kg; P=0.055), and lower lean cut percentage (56.4% vs. 59.0%; P=0.012). These results indicated that a Met-deficient diet produced growth-retarded pigs, which experienced compensatory gain after realimentation. However, at harvest these compensatorily-gained pigs had more fat and less lean than their counterparts.

BSE-31
Name, Major: John Hunt, Biological Engineering
Project Title: *A Study of Biochar's Effect on Bacterial Metabolomics Using NMR Spectroscopy*
Faculty Advisor, Department: Nicholas Fitzkee, Chemistry
Project Type: Poster
Project Category: Biological Sciences and Engineering

Abstract: Biochar is an alternative carbon source that is often used as a soil additive in agriculture, due to its relative ease of production and low cost. Its adsorptive properties make it ideal for removing various free chemicals from soil. It is therefore interesting to know about the effect this has on the bacterial biota which commonly inhabit the soil. One way of examining this is through the microbial metabolome, or the set of chemical pathways the bacteria uses to process available nutrients (metabolites). Our experiments use RPMI media that has been treated with biochar to grow *Escherichia coli* (*E. coli*), a species commonly found in the soil. These samples are compared against activated carbon-treated media and untreated media. The relative concentrations of specific compounds in the media and intracellular activity are measured using NMR spectroscopy. The metabolite concentrations are plotted over a series of timepoints, in order to visualize how adding biochar to an environment could alter the metabolomic pathways bacteria use to survive. We find that both arginine and acetate utilization differ in biochar-treated media, suggesting that these metabolomic pathways may be affected by treatment. The known effects of biochar on cellular metabolism are currently limited, and this work could have applications in modern soil conditioning techniques.

BSE-32
Name, Major: Anna Jackson, Biological Sciences/Biological Sciences
Project Title: *Please Do Not Feed the Animals: An Analysis of the Effect of Anthropogenic Stresses on Mating Behaviors Displayed by Sister Isles Rock Iguanas*
Faculty Advisor Name: Mark Welch, Biological Sciences
Project Type: Poster
Project Category: Biological Sciences and Engineering

Abstract: The Sister Isles Rock Iguana (SIRI) is a critically endangered iguana subspecies endemic to the Cayman Islands with the most robust population residing on Little Cayman. These iguanas are subject to continued population decline due to island development, road traffic, habitat degradation, and predation by invasive mammals. Further reductions in the effective population size exacerbate conditions for loss of genetic diversity by drift and inbreeding. However, the social system of these insular reptiles and the ability of females to store sperm may promote strategies to optimize outbreeding and preserve genetic variability. For example, polyandry may be preferred when females cannot distinguish among closely related kin and additional mates are readily available A disturbed area continuous with the island's major human settlement supports a high density of iguanas year-round due to supplemental feeding and artificial resources. This museum site is indeed attractive to the iguanas with its soft substrate, adequate shading, and abundant nutrition. High resource availability can alter social dynamics by constricting home range sizes and increasing energy expenditure on competition. This system may promote dominance and reproductive skew with just a fraction of males contributing to fertilizations. Due to the high densities at the museum, however, females may experience increased opportunities for extra-pair mating, and thus rates of polyandry can be expected to rise. This study employs full pedigree likelihood methods to assign parentage and sibship to museum hatchlings and examine the extent to which polyandry plays a role in reproductive behaviors of these iguanas. Further, the pairwise relatedness among museum residents as compared to individuals sampled island-wide are examined to assess patterns of localized inbreeding and mate choice occurring at this distinct region of the island. Analyses of the reproductive dynamics of SIRI may serve as essential tools in conserving the iguanas' current level of genetic diversity.

BSE-33
Name, Major: Alyssa Jacobs, Biological Sciences
Project Title: *Wetland Seed Banks: What Are Their Importance in Wetland Restoration?*
Faculty Advisor, Department: Gary Ervin, Biological Sciences
Project Type: Poster
Project Category: Biological Sciences and Engineering

Abstract: In the past quarter century, wetland restoration has gained increased interest due to wetland loss and degradation and the concurrent loss of ecosystem integrity and services. These losses result from changes in land-use and land-cover, in particular, agricultural development. Often, the management goals of these wetland restorations are to re-create a desired structure or function, such as providing a wintering ground for waterfowl, a location for carbon storage, or water filtration. Soil seed banks can be an important factor in restoring these desired wetland characteristics by shaping the future plant communities. Seed banks allow plants to disperse through time; therefore, these dormant seeds may have the potential to re-establish themselves in the emerged plant community following various management efforts. Wetland management may change the composition of vegetation present at a site, with the subsequent community influenced to a varying degree by seed bank composition. To assess potential re-establishment of emergent vegetation through the seed bank, soil was collected from three restored wetlands in the Mississippi Alluvial Valley. The seed bank was characterized through emergence in a greenhouse germination study and subsequent soil processing. The quantity of emergent seedlings was identified while the remaining seeds from the soil samples were enumerated, grouped by morphotype, and photographed. Results indicate that seed bank characteristics differed between the three wetlands. Diversity, seed density, and germination success were influenced by the wetland site. There was also a high variability of seed and seedling numbers within each wetland, indicating substantial spatial variation of seed banks within wetlands. The composition of soil seed banks in relation to agricultural intensity is an important consideration when assessing continuing wetland structure and function as it may influence management strategies landowners take when restoring wetlands.

AH-21
Name, Major: Mikayla James, Human Sciences/Apparel Textiles and Merchandising
Project Title: *Case 304A-227; Forgotten Identity*
Faculty Advisor, Department: Lori Neuenfeldt, Art
Project Type: Poster
Project Category: Arts and Humanities

Abstract: Mikayla James Case 304A-227; Forgotten Identity Garments of the nineteen thirties and forties were typically plain and modest in comparison to current styles. One garment representing the modesty of the period from the MSU Historic Costume and Textiles Collection (HCTC) is a navy-blue dress with two decorative pieces of fabric across the front. We know that this dress is a Grovine creation, which was a popular brand in the thirties and forties, and it is similar in make and form to other dresses from this time period. However, we do not know who the user would have been nor whether or not the plain and modest styling is representative of the time period. The purpose of this case study is to determine the user of this garment and if the style features are similar to fashion style from the 1940's. We will conduct research from our archives and collections files, to build a user profile. We will collect images from popular fashion magazines during this time period and do a comparison analysis between images and the dress from the HCTC. We can theorize that this dress originated in the nineteen forties and was worn by someone who would have been considered upper middle class who may have wanted to be associated with the fashion forward starlets of the day.

AH-22
Name, Major: Audrey Jarvis, Human Sciences/Apparel Textiles and Merchandising
Project Title: *Revitalizing Economic Growth: A Case Study of Micro, Small and Medium Fashion Enterprises (MSME) in Montgomery and Webster Counties in Mississippi, USA*
Faculty Advisor, Department: Dr. Caroline Kobia, Fashion Design and Merchandising
Project Type: Talk
Project Category: Arts and Humanities

Abstract: More than ever the business environment today has become increasingly competitive. In order to keep up with the increasing expectations of customers, Micro, Small and Medium Enterprises (MSME) must evolve by initiating upgrading processes and adopting new technologies. The stagnation of MSME and the productivity gap is not only a problem for individual enterprises, but may negatively impact the industrial competitiveness and social inclusion of the rural/small town economy. With the need for community-driven economic development, support for existing MSME is critical. Economic drivers include building the local economy through regional development resources, establishing support for innovative start-ups, and supporting the growth of existing MSME enterprises. Even though current assistance agencies provide financial and skill development support, university and extension resources are needed since they are the primary resource for research-based solutions to local problems. Therefore, the purpose of the research project is to evaluate the contributions and impacts of MSME fashion businesses to a community's economic engine. The first goal is to increase awareness and support for MSME fashion businesses. The second goal is to develop research-based application models to help MSME fashion businesses to increase economic impacts and promote continued community economic growth. The research model is developed through the three phases of Human-Centered Design (HCD). The Inspiration phase, interviews, and surveys are in progress to identify specific needs and issues with identified MSME. The goal is to gain insights about both internal (e.g., business owners) and external environments (e.g., technology, trade environment) pertinent to the MSME. During the Ideation phase, innovative prototypes/models for enterprise growth will be developed based on results from the Inspiration phase and available resources. Once tested and revised, the models will be refined through multiple iterations. During the Implementation phase, a plan for the refined models will be provided to the business owners.

AH-23
Name, Major: Michelle Jean, Human Sciences/Apparel Textiles & Merchandising
Project Title: *Sweet Skins Sunscreen*
Faculty Advisor, Department: Eric Hill, Charles Freeman, and Stephen Meyers, Human Sciences/Apparel Textiles and Merchandising
Project Type: Poster
Project Category: Arts and Humanities
Other Categories: Community Engagement

Abstract: We are presenting a sunscreen made with sweet potatoes. This sunscreen is different from the rest in the fact that the sweet potatoes make the sunscreen organic as well as provide more Vitamin E which is good for the body. To make our product even more outstanding we are keeping it cool. This cooling effect will be beneficial when you are out in the sun and you reapply because it will feel good on your hot skin. If it feels cool then consumers will be more likely to continue to reapply and that will hopefully help decrease skin cancer risks. This is SweetSkins.

BSE-34
Name, Major: Jacob Jones, Wildlife & Fisheries Science/Aquaculture and Fisheries Science
Project Title: *Comparison of three egg collection devices for Gulf Killifish (Fundulus grandis)*
Faculty Advisor, Department: Peter Allen, Wildlife, Fisheries and Aquaculture
Project Type: Poster
Project Category: Biological Sciences and Engineering

Abstract: The Gulf killifish (Fundulus grandis) is a small, euryhaline fish species occurring in estuarine areas along the northern Gulf of Mexico coast. This species is capable of rapidly moving between fresh and salt water and as a result is quite hardy to environmental changes, leading to its popularity as a baitfish for sportfish species such as Red Drum (Sciaenops ocellatus) and Spotted Seatrout (Cynoscion nebulosus). This remarkable trait also facilitates its culture in low salinity conditions, even freshwater ponds. However, several culture bottlenecks remain before Gulf Killifish can be developed at the commercial level. The primary bottleneck is the collection and incubation of eggs. In nature, females deposit eggs episodically on vegetation during new moon phases of tidal cycles. Recent research has shown that eggs can be collected in spawning mats suspended in tanks and incubated in a moist aerial environment, such as an incubator. Limitations are in difficulties associated with the separation of eggs from collection mats, and the space required to incubate eggs. Simplification of the process of egg collection and incubation is needed prior to commercialization. Therefore, this experiment compared egg deposition and fertilization by Gulf Killifish and the difficulty of collecting eggs using three different collection devices: spawning mats, disk collectors, and nylon mesh collectors. Adult Gulf Killifish were distributed in three commercial-scale (4,000-L) recirculating tank systems at 9 ppt. All three types of egg collection devices were used in each tank, with eggs collected every two days, quantifying collection time, egg abundance, and fertilization percentage. Information will be useful for determining the most efficient egg collection device and guiding commercial culture protocols through estimates of egg output per female and periodicity between egg collection.

PSE-09
Name, Major: Mangesh Joshi, Mechanical Engineering
Project Title: *River levees analysis using remotely sensed Synthetic Aperture Radar (SAR) imagery.*
Faculty Advisor, Department: Lalitha Dabbiru, Geosystems Research Institute (GRI)
Project Type: Poster
Project Category: Physical Sciences and Engineering

Abstract: The main focus of the research is to detect vulnerabilities on the Mississippi river levees using remotely sensed Synthetic Aperture Radar (SAR) imagery. Unstable slope conditions can lead to small landslides which weaken the levees and increase the likelihood of failure during floods. This research analyzes the ability of detecting the landslides on the levee with different frequency bands of synthetic aperture radar data using supervised machine learning algorithms. The two SAR datasets used in this study are: (1) the X-band satellite-based radar data from DLR's TerraSAR-X (TSX), and (2) the L-band airborne radar data from NASA JPL's Uninhabited Aerial Vehicle Synthetic Aperture Radar (UAVSAR). On-site inspection of levees is expensive and time-consuming, so there is a need to develop efficient techniques based on remote sensing technologies to identify levees that are more vulnerable to failure under flood loading. Synthetic Aperture Radar (SAR) technology, due to its high spatial resolution and potential soil penetration capability, is a good choice to identify problem areas along the levee so that they can be treated to avoid possible catastrophic failure. The research also evaluates two of the most popular texture feature extraction methods; the discrete wavelet transform (DWT) and the grey level co-occurrence matrix (GLCM) to detect slump slides. A support vector machine (SVM) classifier will be used to classify the Synthetic Aperture Radar (SAR) imagery.

SS-24
Name, Major: Caroline Kelsoe, Economics (A&S)
Project Title: *Firm Product and Pricing Decisions Using Data from a Willingness-to-Pay Experiment*
Faculty Advisor, Department: Kalyn Coatney, Agricultural Economics
Project Type: Poster
Project Category: Social Sciences

Abstract: Most new products introduced in the market place fail to meet the profitability expectations of firms. In an attempt to reduce product failure and inform producers of likely successful products, pre-introduction market research may be conducted. Conducting consumer product valuation experiments is a common approach used to derive consumer willingness-to-pay estimates for new products and/or identify the value of product characteristics. The results of these types of studies are intended to inform producers of the potential to earn greater returns from supplying the new product and/or improving existing product characteristics. However, consumer centric analyses have yet to address the likelihood that the new product will result in improved profitability. The goal of this research is to extend a published consumer demand analysis to include the relevant decisions of a hypothetical profit maximizing producer. Given an estimated consumer demand from the study, the producer is faced with making both pricing and product choice decisions subject to relevant costs of production. In all, the producer's objective is not to simply pick the product line with the observed highest average value to decide whether a new product line should be adopted. But rather, the producer's objective is to determine which value-added product line, if any, is expected to improve profitability subject to product costs and competition. The methodology developed in this study will provide stakeholders with a more complete means to analyze the likely success of a new product and contribute to the consumer willingness-to-pay academic literature.

AH-24
Name, Major: Samuel Kennemer, Landscape Architecture
Project Title: *Denver Transportation: Sustainability Review*
Faculty Advisor, Department: Cory Gallo, Landscape Architecture
Project Type: Poster
Project Category: Arts and Humanities

Abstract: Denver, Colorado is a city striving to provide sustainable transportation for its residents. Sustainable transportation factors environmental, social, and economic considerations into everyday travel. This protects the world we live in, allows us to engage with the people around us, and produce jobs to support us. Some of the transit systems that Denver is implementing include light rail services, mass transit busses, bike lanes, and sidewalks. These have given Denver a start in the right direction towards sustainable transportation, but there is still plenty of room for improvement. The public transportation system that services all of Denver is known as the Regional Transportation District, or RTD. In 2016, 103 million riders were documented on their bus and light rail systems. RTD has already begun steps towards environmental sustainability by installing electronically-controlled engines and transmissions in their fleet of buses as well as replacing older engines with advanced, clean-burning, low emission engines. In regards to social sustainability, Denver is an extremely walkable city, and they also promote cycling. Finally, Denver is becoming more economically sustainable by consistently reducing their water usage by at least 4% each year from 2010 to 2013. In addition, Denver has one of the largest inventories of LED lights in the country, which last longer and are more environmentally friendly than regular traffic lights.

AH-25
Name, Major: Georgeann Kenney, English
Project Title: *Self-Love vs. Self-loathing through letters in Frankenstein*
Faculty Advisor, Department: Andrea Spain, College of Arts and Science, English
Project Type: Talk
Project Category: Arts and Humanities

Abstract: This work presents an analysis of Mary Shelley's Frankenstein through the lens of Jacques Derrida's theory of deconstruction to argue that the epistolary framework in the novel creates a tense atmosphere that produces emotional ambiguity within the Creature. My argument's foundation rests on a discussion of love and loathing as a false binary. I argue that the Creature feels that these feelings are completely distinct from one another and that furthermore they mark the distinction between humanity and monstrosity. I demonstrate that the Creature believes and internalizes that either he is worthy of love or loathing, depending on his status as "human" or "creature." Through an analysis of the Creature's identification with Safie – the Arabian woman with whom he studies and learns from – I trace his wavering between a sense of acceptance and rejection of his own humanity. Building on Louis Othoniel-Rosa's claim that the Creature is incapable of fully understanding his own physical fragmentation, I argue that analogously he – like every human – has difficulty navigating emotional fragmentation. Ironically, the Creature reads this struggle within the self as another "blot" signaling his inhumanity. Tracing his moments of hope derived from Safie's teaching and her letters, I argue that his hopes are dashed – not due to his monstrous body – but due to a desire to come to an unambiguous conclusion about what it means to be human. Safie's distance via the narrative framework, particularly the letters which are four times removed from the first narration, demonstrates the instability of meaning. I argue, in conclusion, that the text demonstrates the "blot" of the human: that humanity itself demands emotional ambiguity and fragmentation.

SS-25
Name, Major: Olivia Kesler, Educational Psychology
Project Title: *To Know or Not to Know? Exploring Perceptions on Genetic Testing in Adoption*
Faculty Advisor, Department: Kasia Gallo, Educational Psychology
Project Type: Poster
Project Category: Social Sciences

Abstract: Children are often adopted into families that have little or no knowledge of their child's biological family history. Thus, it could be seen as a necessity to have the child tested or screened to fill in the gaps of their unknown background. The purpose of this project is to review the literature relevant to the issue of genetic testing in adoption. Different perceptions among adoptive parents, medical professionals, social workers, and adoptees themselves are considered for the development of this review. Adoptive parents and social workers generally align in favor of testing children, citing that the information leads to a feeling of "completeness" and even increased adoptability. Medical professionals and adoptees, on the other hand, are hesitant to test children, citing that it threatens their personal autonomy. This research will provide valuable insight into the various ethical as well as practical concerns regarding the genetic testing of adopted children.

SS-26
Name, Major: Marisa Laudadio, Communcation/Public Relations
Project Title: *Comment Analysis on Proposed International Adoption Rule*
Faculty Advisor, Department: Dr. Holli H. Seitz, Communication
Project Type: Poster
Project Category: Social Sciences

Abstract: Background. In 2016, the Department of State proposed to amend regulations for intercountry adoption by increasing requirements for authorized adoption service providers, establishing new parameters regarding fees and use of foreign providers, and increasing training for prospective adoptive parents. The proposed rule was available for public comment on regulations.gov for two months. During that time, 295 comments were posted. This project examines the content and valence of those comments to address the following research questions: 1) What is the predominant public sentiment toward the proposed rule? 2) Did commenters share a common characteristic? Method. All public comments on the proposed rule (N=295) were collected for analysis. A subsample of comments (n=108) was manually coded for valence (supporting the rule, neutral, opposing the rule), mention of someone who has adopted, mention of someone trying to adopt, mention of someone working in an adoption-related occupation, mention of the comment author being an adoptee, and inclusion of statics. A second coder recorded a 20% sample of comments (n=22) to establish inter-rater reliability. Reliability was calculated using Krippendorff's alpha and reached acceptable levels for all variables reported. Results. The average word count for all comments was 199.9 (SD=178.3). Of the 108 coded, 86.1% opposed the rule, 4.6% were neutral, and 9.3% supported the rule. Sixty-seven percent of commenters had either adopted or were in the process of adopting. Of those that had adopted before, 84.1% opposed the rule, 2.3% were neutral, and 13.6% were in favor. Of those in the process of adopting, 91.2% opposed the rule, 5.9% were neutral, and 2.9% supported it. Conclusions. The majority of commenters either strongly opposed or supported the rule. A greater percentage opposed it. Most commenters had been personally affected by adoption. Personal experience may have driven the commenters' perspectives and their strong feelings regarding this issue.

BSE-35
Name, Major: Ethan Lee, Forestry/Environmental Conservation
Project Title: *Does a Spatial Relationship Exist Between the Locations of Opuntia Pusilla Plants and Ant Colonies?*
Faculty Advisor, Department: Christopher Brooks, Biology
Project Type: Poster
Project Category: Biological Sciences and Engineering

Abstract: In experimental systems, it has been shown that predators can influence local plant communities by regulating herbivory. So it is important to understand how predators influence herbivores, especially in unique ecosystems. The Army Corps of Engineers dumps dredged soil from the Tennessee-Tombigbee Waterway on a plot of land adjacent to the TTW and the Town Creek Campground. The result is an area with deep, sandy soil that has facilitated the growth of a large population of one species of prickly pear cactus, *Opuntia pusilla.* Female moths of the Eastern Blue Cactus Borer, *Melitara prodenialis*, will lay their eggs (stacked on top of one another into "eggsticks") on the cladodes of *Opuntia* plants where their caterpillars will hatch and burrow into the stem segments of the plant. Ants are known to prey on eggs of cactus moths, and it has been observed that eggsticks are not present on plants growing near ant colonies. It is possible that the locations of ant colonies and *Opuntia* plants are related and that the organisms have a spatial relationship that would benefit both the ant colonies by providing a food source while the *Opuntia* plants are protected from herbivory. My objective for this experiment is to determine whether or not a spatial relationship actually exists in the placement of *Opuntia* plants and the ant colonies. To investigate this, I am using a high-resolution image taken by the Geosystems Research Institute to determine the location of the ant colonies. I am in the process of ground truthing the image while taking measurements from predetermined points to check the placement of the *Opuntia* plants. My results, and subsequently my conclusions, will be generated once these measurements are completed and analyzed.

BSE-36
Name, Major: Leah Leonard, Forestry/Wildlife Management
Project Title: *Improving Growth and Yield Estimates from Growth Index Ratio Method of Stand Table Projection in Red Oak-Sweetgum Bottomland Hardwood Stands*
Faculty Advisor, Department: Charles Sabatia, Forest Biometrics
Project Type: Poster
Project Category: Biological Sciences and Engineering

Abstract: Improving Growth and Yield Estimates from Growth Index Ratio Method of Stand Table Projection in Red Oak-Sweetgum Bottomland Hardwood Stands 1Leah F. Leonard, 2Charles O. Sabatia, 3Thomas G. Matney, 3Emily B. Schultz, and 4Theodor D. Leininger Undergraduate Student1, Assistant Professor2, Professor3, and Project Leader4 Responsible management regarding a forest resource requires knowledge of its current and future status. While information on current status may be readily obtained, that on future status requires use of a prediction system based on current measurements. Stand table projection (STP) and forest growth and yield models are techniques commonly used by foresters. STP it is less complex and better suited to mixed-species and uneven-aged stands. Individual tree measurements from 83 red oak–sweetgum mixed species forest stands in minor stream bottoms in Mississippi were used to investigate how well STP worked for these forest types. The main objective of the research was to determine the range of stand ages where STP projections were biased and the range where the projections were unbiased. An additional objective was to determine if greater precision of tree diameter measurements improved precision of STP projections. Findings from the research indicated that STP was generally unbiased for stands in the age range 40 to 70 years and that greater precision of diameter measurement, than currently used, does not result in more precise STP estimates.

PSE-10
Name, Major: William Leonard, Industrial Engineering
Project Title: *Optimizing Throughput for a Wireless Network with Directional Antennas Subject to Signal Jamming*
Faculty Advisor, Department: Hugh Medal, Industrial and Systems Engineering
Project Type: Poster
Project Category: Physical Sciences and Engineering

Abstract: Despite the prevalence of research on the wireless network jamming problem (WNJP) in the field of operations research, little research has been conducted on the WNJP for a wireless network containing directional antennas rather than the more common omnidirectional antennas. The WNJP involves a wireless network with multiple antennas transmitting data to each other subject to interference conditions, i.e., signal jamming. In the type of network studied by the WNJP, the operator seeks to maximize the flow of data through the network ("throughput") subject to the constraint of signal jamming, which may be optimized with linear programming methods. All past studies on the WNJP have only considered networks that transmit data with omnidirectional antennas – antennas that transmit a wireless signal a uniform distance in all directions. This project is the first to investigate a wireless network that uses directional antennas, which transmit a wireless signal in mostly just one direction from each antenna in a replicable pattern. Using linear programming methods, this research project optimizes the throughput for a wireless network equipped with directional antennas that is subject to signal jamming. Specifically, the Python programming language is used to model the network, while Gurobi, a mathematical programming solver, is used to find the resulting optimal data. The data produced by these methods is intended to demonstrate how to maximize the throughput in a wireless network with directional antennas subject to signal jamming.

BSE-37
Name, Major: Mark Lewis, Biochemistry
Project Title: *Application of magnetic nanoparticles for boar sperm sexing*
Faculty Advisor, Department: Dr. Jean Feugang, Animal and Dairy Sciences
Project Type: Poster
Project Category: Biological Sciences and Engineering

Abstract: Application of Magnetic Nanoparticles for Boar Sperm Sexing Semen ejaculates contain a mixed population of spermatozoa bearing X or Y chromosomes that make the resulting offspring's gender unpredictable. The ability to predict the gender of the embryo formed upon fusion of sperm and egg at fertilization would have a great impact on the economy of the animal husbandry industry, by saving time and money to farmers. Spermatozoa or embryos are often used for gender selection, but the currently available techniques are either time-consuming, expensive, or less efficient. The current advances in nanotechnology provide new tools that may allow for gender selection through sperm sexing. Previous studies conducted in our laboratory have showed that magnetic nanoparticles can be used for semen (nano)purification without affecting their function. Here we explored the efficacy of newly designed magnetic nanoparticles (MNP) for sperm sexing. Pooled boar semen doses (n=4) were mixed with MNP designed to target X-spermatozoa. After 30, 90, and 120 minutes incubation to allow optimal sperm-MNP interactions, spermatozoa were separated under an electromagnetic field and eluted, presumptive Y-chromosome bearing spermatozoa were collected for analyses. Sperm motility characteristics were assessed with a Computer-Assisted-Sperm-Analyzer (CASA), followed by sperm DNA extraction and gene expression analysis to detect Y-chromosome. Resulting amplicons of polymerase chain reactions (PCR) were resolved on an agarose gel electrophoresis for visualization. Motility data were statistically analyzed with a t-test. The designed MNP revealed significant positive effects on sperm motility characteristics (motility and velocities). The current PCR conditions were functional and the designed primers to target Y-chromosome allowed for the generation of PCR amplicons of expected band sizes. These preliminary findings indicate beneficial effects of the designed magnetic nanoparticles on sperm motility while the designed primers will help improve the sperm sexing procedure in future studies.

SS-27
Name, Major: Whitney Littlejohn, Animal and Dairy Sciences
Project Title: *Study Abroad Autoethnography*
Faculty Advisor, Department: Laura Greenhaw, School of Human Sciences
Project Type: Poster
Project Category: Social Sciences
Other Categories: TRC

Abstract: Study Abroad Autoethnography According to the Mississippi State University Office of Study Abroad, 354 MSU students studied abroad between Fall 2015 and Summer 2016. Mississippi students accounted for a meager 0.78% of all students who studied abroad between 2014 and 2015 (Trends). According to the Association of Public and Land-Grant Universities (APLU), "studying abroad is a powerful educational tool", and making study abroad more common will benefit future generations of Americans (Global Competence, 2005, p.6). Research has shown that studying abroad has helped graduates acquire important career skills, and has continued to influence their perspective on world events (Global Competence, 2005, p.6). Senators James William Fullbright and Paul Simon believed that studying abroad "helps transcend traditional, national, and cultural boundaries, and breaks down the psychological, political, and spiritual isolation of peoples" (Global Competence, 2005, p.31). While various studies have investigated the barriers to study abroad, as well as the benefits, there is a lack of qualitative research that explores the impact on and perceptions of students who experience a different culture. As a student who studied abroad in Vietnam, I will take an autoenthnographical approach to analyze the Vietnamese culture, in order to illuminate the impact of my study abroad experiences. Data analysis will be conducted utilizing journal entries, emails, as well as photos to recall my experiences, examine the growth I experienced as an individual, and to depict the lasting impact of my study abroad journey on my life.

SS-28
Name, Major: Abigail Long, Educational Psychology
Project Title: *A PERFECT STORM: A Study of Antisocial and Prosocial Psychopaths*
Faculty Advisor, Department: Kasia Gallo, Educational Psychology
Project Type: Poster
Project Category: Social Sciences
Other Categories: TRC

Abstract: Most often, the term "psychopath" is used as a blanket-term describing individuals that lack empathy and have an inherently violent nature. While it is true that the defining characteristic of a psychopath is a lack of empathy, little research has been done to uncover the totality of the condition. Recently, researchers have found that not all psychopaths are antisocial, and some actually become successful contributors to society. This paper seeks to examine the metaphorical "fork in the road" for these individuals; what makes some break and others keep it together? This literature review focuses on the physical side of psychopathy, such as differences in brain structure, as well as environmental risk factors that make an individual more likely to resort to criminal and violent behavior. Finally, this paper takes an alternative perspective on the issue and seeks to answer a controversial question: are there benefits to being a psychopath? This review concludes that there are many environmental and biological risk factors that play a part in determining the life path of a psychopath. Secondly, there is evidence that psychopathic traits can potentially aid in the success of certain professional and social pursuits. The findings of these studies shed light on a very interesting, yet highly under researched topic. Future researchers should focus more on the subject of psychopathy so that we can develop better treatment and prediction techniques for these unique yet potentially dangerous individuals.
Keywords: Psychopathy, violent behaviors, prosocial psychopath

PSE-11
Name, Major: Phong Ly, Civil Engineering
Project Title: *Improving Pellet Properties Using Agricultural Waste as Additives*
Faculty Advisor, Department: Jason Street, Sustainable Bioproducts
Project Type: Poster
Project Category: Physical Sciences and Engineering

Abstract: Biomass is a renewable source of energy that originates from organic material such as plants and animal waste. Because of the steady rise of oil prices and the intensifying concerns of global warming, the demand for biomass has also increased. Production of biomass energy has favored the compactness and homogeneity of solid cylindrical biofuels, also known as pellets. However, due to the expensive process of densification as well as deterioration during transportation, pellet production has not outperformed that of fossil fuels. In this experiment, the production of pellets was performed by using a pneumatic piston that compresses wood particles at high temperatures. The ultimate goal is to methodically design pellets based on the following variables: wood species mixture, temperature of formation, additive content ratio, and moisture content ratio. The variables most conductive to forming pellets with the best qualities were determined by testing one variable at a time. Following production, the energy content of these pellets were then tested using a bomb calorimeter while its durability was tested using a tumbler. This experiment will determine the best combination of all of these variables that will produce a biofuel that will release substantial amounts of energy, improve the durability of the pellet, and maintain low production costs.

PSE-12
Name, Major: Ben Mackin, Physics
Project Title: *"Jeopardy-like" Game Console*
Faculty Advisor, Department: James Dunne, Physics and Astronomy
Project Type: Poster
Project Category: Physical Sciences and Engineering

Abstract: Often, students who struggle with math- and science-based classes rely heavily on reviews by teachers for retention of material. The purpose of this project was to build a "Jeopardy-like" game console to use as a review tool in the classroom in order to improve learning. The console itself is meant to engage students with class material in a fun and interesting environment. Firstly, code was installed on an Arduino board, which served as the microcontroller of the game console. Physical concepts including current, resistance, voltage, capacitance, and were then applied in the circuitry of the game console. The resources in the machine shop and nuclear physics lab of the Mississippi State University Physics building were used to construct the hardware of the game console, using original design specifications. The console was built in approximately 80 work hours, but because of its inherent replicability, future build times are expected to be much lower. The console is designed for use by up to four players and, when in use, is integrated with PowerPoint to display questions in the style of the game show "Jeopardy." Future studies using the console will be done in classrooms to examine its effectiveness as a review tool in math- and science-based classes.

SS-29
Name, Major: Katelyn Majors, Psychology
Project Title: *Predicting Fear of Happiness via an Implicit Measure of Emotion States Over Approximately One Year*
Faculty Advisor, Department: Dr. E Samuel Winer, Psychology
Project Type: Poster
Project Category: Social Sciences

Abstract: This study examined whether endorsement of happiness on an implicit measure of emotion would predict future self-reported fears of happiness. We collected, online via Amazon's Mechanical Turk for $1-3, response time and happiness indicators on a brief implicit measure of emotion and scores on the Fear of Happiness Scale (FHS), a questionnaire assessing apprehension about experiencing happiness. To assess endorsement of implicit emotions, 209 participants chose which emotion (anger, fear, happiness, sadness, or none) they thought best corresponded to a Chinese character (Bartoszek & Cervone, in press). They then completed the FHS approximately one year later. We hypothesized lower implicit endorsement of happiness would predict future fear of happiness, with response time moderating this relationship, such that quick responders would be more likely to evidence it. Analyses were conducted via Model 1 of the PROCESS macro. Implicit endorsement of happiness ($b = -.152$, $SEb = .303$, $p = .617$) did not significantly predict future FHS responses; however, the interaction approached significance ($b = 1.140$, $SEb = .624$, $p = .069$), with simple slopes indicating that, for individuals responding faster, there was a significant negative relationship between endorsement of happiness and fear of happiness ($b = -0.682$, $SEb = .321$, $p < .05$). Thus, for individuals responding quickly, endorsing less happiness on an implicit task indicated greater likelihood to express fear of happiness, even when assessed one year later, suggesting that experimental implicit measures of happiness may be used to predict devaluation of reward (Winer & Salem, 2016) over time.

BSE-38
Name, Major: Alexis Manson, Biochemistry
Project Title: *Identification and Analysis of Volatile Organic Compounds of Macrophomina phaseolina (Charcoal Rot Fungus) in Sweet Potato Storage Roots*
Faculty Advisor, Department: Richard Baird, Plant Pathology
Project Type: Poster
Project Category: Biological Sciences and Engineering

Abstract: Macrophomina phaseolina (M. phaseolina) is a destructive soilborne fungal pathogen that proliferates in arid climates and causes diseases in plants such as damping off, seedling blight, wilt and charcoal rot. Infecting numerous plant species such as corn, sweet potato, and soybean, M. phaseolina bears a great economical significance to agriculture (particularly in Mississippi as it is the third largest producer in the country). The goal of this research is to develop an instrument that can detect M. phaseolina prior to storage thereby reducing contamination and increasing yields. In order to do so, different isolates of M. phaseolina were analyzed, focusing on the possible variation in VOCs between morphologically different isolates. Upon isolation, M. phaseolina can appear "flat", "fluffy", or an intermediate of the two. A large pool of over 100 sweet potato root isolates was placed into these morphological groupings and then a randomization process was used to select replicate isolates to perform VOC studies. The VOCs were collected using solid phase microextraction (SPME) fibers and analyzed using a Gas Chromatography-Mass Spectrometer (GC-MS). Next, sweet potato storage roots were inoculated with the fungus and their VOCs were compared to un-inoculated sweet potato tissue using a similar procedure. These results will be discussed using various statistical comparisons

AH-26
Name, Major: Gabrielle Martinez, Human Sciences/Apparel Textiles and Merchandising
Project Title: *Spring Cotillion*
Faculty Advisor, Department: Lori Neuenfeldt, Art
Project Type: Poster
Project Category: Arts and Humanities

Abstract: Gabrielle Martinez Human Sciences (Fashion Design and Merchandising) Project Name: Spring Cotillion Abstract: The 1950’s is characterized by conformity and style. While nuclear families were keeping up with the Jones’s, one of the most iconic garments from this era is the cotillion dress. This dress, obtained by the university through a personal donation, was once in the wardrobe of Mrs. Mary Totty from Bruceton, TN. Although the dates of when the dress was actually worn are unclear, the construction and tags suggest it was most likely made and worn during the early to mid-1950’s. This cotillion dress has the iconic A line silhouette and tea length. It is strapless and adorned with cream lace and an abundant of light blue tulle. The skirt’s unique fleur-de-lis design gives this particular dress personality and sophistication. Laced in pearls and day gloves, a woman of society would have worn this dress to an occasion in the Spring. Although this garment is slightly discolored it remains in good condition. This poster session will include photographs of the dress, technical measurements of the dress, illustrations, information about its construction and materials, and a brief history about the significance of the cotillion dress to women of the 1950’s.

SS-30
Name, Major: Kaitlyn May, Educational Psychology
Project Title: *Media multitasking in relation to cognition and sociopsycho well-being: a literature*
Faculty Advisor, Department: Anastasia Elder, Educational Psychology
Project Type: Poster
Project Category: Social Sciences
Other Categories: TRC

Abstract: With the rapid expansion of media use by children and adults, media multitasking (engaging in more than one media activity at a time) has rapidly become a lifestyle for American youth (Roberts, Foehr, & Rideout, 2005). The aim of this systematic review is to examine the cognitive and socio-emotional impacts of media multitasking (MMT). This review analyzed 59 articles from 2006 to 2016 that investigated MMT across a range of ages, including pre-adolescents to adults, although primarily focused on college-aged students. With regards to academic and cognitive skills, media multitasking is detrimental to the learning of both those multitasking and other classroom peers in the vicinity. In-class multitasking is negatively associated with grades, note taking, test performance, and self-regulation, and is not buffered by achievement level (Fried, 2006; Zhang, 2015). In terms of socio-emotional well-being, media multitasking has mixed effects dependent upon medium and context. Research on tweens using technology points to multiple negative socio-emotional outcomes with respect to usage, including psychological distress, diminished sleep, and higher levels of social stress (Pea et al., 2012). Similarly, college females were found to demonstrate more maladaptive behavior with respect to mobile phone use (i.e., deterioration of family and social relationships, reduction of activities, tendency to evade problems; Beranuy et al., 2009). Still, some positive social feelings were reported for tweens: media multitasking was associated with a greater orientation to finding positive feelings from friends. Overall, constant multitasking has multiple cognitive and socio-emotional effects for students, such as (a) high ratings of distractibility, (b) negative impact on academic performance, (c) decreased speed when performing academic tasks, (d) psychological distress, (e) greater levels of social stress.

BSE-39
Name, Major: Kelsey McArthur, Biochemistry
Project Title: *Phenotypic Switch of Vascular Smooth Muscle Cells in Vascular Calcification*
Faculty Advisor, Department: Chartisa LaShan Simpson, Agriculture and Biological Engineering
Project Type: Poster
Project Category: Biological Sciences and Engineering

Abstract: One of the leading causes of death in patients with kidney disease or diabetes is cardiovascular complications. Past studies considered vascular calcification a passive process that resulted from elevated calcium-phosphate interactions. However, it is now considered an active cell-mediated process. This occurs through competition of proteins that promote calcification and inhibitors which cause arteries to harden. Current research has shown that these arteries harden analogously to bone development. It has been suggested that smooth muscle cells (SMC) in healthy arteries experience a genetic switch to osteoblast-like cells when exposed to high levels of glucose, calcium, phosphate, and cholesterol. While many researchers have recognized this anomaly, the molecular and cellular mechanisms that facilitate calcification remains unclear. Our in vitro model was developed to prompt vascular calcification and distinguish the genetic switching from healthy smooth muscle cells to osteoblast-like cells. Our goal is to use this in vitro model to examine the Wnt Signaling pathway involved in vascular calcification and use Sclerostin to block activation of the pathway. From this, we can determine the effects this protein and pathway have on calcification.

SS-31
Name, Major: Dara McCluskey, Human Sciences/Apparel Textiles & Merchandising
Project Title: *Consumer perception of apparel industry social responsibility*
Faculty Advisor, Department: Dr. Charles Freeman, School of Human Sciences
Project Type: Poster
Project Category: Social Sciences

Abstract: In the dynamic industry of fashion, trends are constantly rotating among consumers and designers alike. In order to keep up with demand, retailers are making clothing faster and cheaper than ever before. However, the industry is becoming increasingly aware of the effects this "fast fashion" has on product life cycle, as well as people and our planet. The purpose of this study is to examine consumer perceptions of social issues in the apparel manufacturing industry and to identify a possible correlation to apparel purchase intention. An online survey measuring these variables will be administered to undergraduate students at Mississippi State University throughout a two-week period. The survey, which includes a pre- and post-test, asks a series of questions before and after showing a trailer for The True Cost, a documentary that reveals the deep impact of fashion on the people and resources that produce it. Although years of research have been conducted on the impact of production conditions on consumer behavior, none exists examining a current, relevant documentary in this specific form. The relationships among eight variables being explored include the following: knowledge, concern, responsibility of prevention, possible solutions, foreign issues, suspicion of business intentions, altruism, and perceived effectiveness. We hypothesize that viewing the trailer will nurture a more personal connection with social issues in the apparel manufacturing industry, thus creating a positive relationship among variable comparisons.

AH-27
Name, Major: Erin McCord, Human Sciences/Apparel Textiles and Merchandising
Project Title: *Jacket Case Study*
Faculty Advisor, Department: Charles Freeman and Lori Neuenfeldt, School of Human Sciences
Project Type: Poster
Project Category: Arts and Humanities

Abstract: Tailoring garments that belonged to others is a tradition that goes back thousands of years. This women's jacket dates to the 1800s. It has canvas-backed buttons and baleen boning. It is made of dark blue velvet that has become worn from use. However, the jacket shows evidence of alteration, so we do not know what features are original to the garments, which may skew the estimated time. Therefore, the purpose of the case study is to determine the actual date of the jacket. We must date every portion of the piece to see which parts are original and which are additions. We believe the jacket was created in the mid 1800's and modified in the late 1800's. The neckline was lowered as styles became less conservative.

BSE-40
Name, Major: Christopher McGee, Animal and Dairy Sciences
Project Title: *Characterizing fetal liver and placental steroid metabolizing enzymes from dams supplemented with melatonin*
Faculty Advisor, Department: Caleb Lemley, Animal and Dairy Sciences
Project Type: Poster
Project Category: Biological Sciences and Engineering

Abstract: Melatonin is a strong antioxidant that influences uteroplacental hemodynamics in cattle. The objective was to examine fetal liver and placental steroid enzyme activity during maternal melatonin supplementation. Commercial beef heifers (n = 12) were bred via artificial insemination and delegated to melatonin implants (MEL; n = 6) or non-implant control group (CON; n = 6). All treatments were applied at day 180, 210, and 240 of gestation, and heifers underwent Caesarian removal of the fetus at 243 ± 2 day of gestation. Placental samples were collected and separated into maternal (caruncle; CAR) and fetal (cotyledon; COT) portions. Additionally, the fetal liver was harvested. Cytochrome P450 1A (CYP1A), 2C (CYP2C), 3A (CYP3A), and uridine 5'-diphospho-glucuronosyltransferase (UGT) activities were determined via luminogenic substrates and expressed per mg of protein. Data were analyzed, using the Wilcoxon rank sum test using the MIXED procedure of SAS with treatment, fetal sex, and the interaction thereof in the model. Statistical significance was declared at $P \leq 0.05$. Activity of CYP1A in CAR was decreased ($P = 0.02$) in male vs. female fetuses from CON dams; however, activity of CYP1A in fetal liver was increased ($P = 0.01$) in male vs. female fetuses. Activity of CYP2C and CYP3A were not different between treatments ($P \geq 0.41$). Activity of UGT in COT was decreased ($P = 0.03$) in male fetuses from MEL dams vs. female fetuses from MEL dams and male fetuses from CON dams. Activity of UGT was increased ($P = 0.002$) in fetal liver from MEL dams compared to fetal liver from CON dams. In conclusion, melatonin supplementation did alter hormone metabolizing enzymes in fetal liver and placental tissues of gestating cattle. Moreover, the difference in activity of steroid metabolizing enzymes in male and female fetuses may indicate a physiological adaptation to decrease excessive exposure.

AH-28
Name, Major: Katie McMurtry, Human Sciences/Apparel Textiles and Merchandising
Project Title: *1960's Womens Rain Coat Case Study*
Faculty Advisor, Department: Charles Freeman Lori Neuenfeldt, Historic Costume
Project Type: Poster
Project Category: Arts and Humanities

Abstract: This garment was made in the 1960's. The purpose of the clothing was to protect women from the rain. This women's raincoat has two distinct colors. The dominant color is tan and it has black 1.5-inch polka dots covered all over. The polka dot pattern gives the raincoat a "1960's style". The garment is in great shape and it can be safely handled without further damage. The only issue associated with this garment is that one button is missing on the front opening. The labels placed on the tag is written as "Lady Bayard". The rain coat is a size 13. The reason why I chose to do a case study on this garment, is because the pattern and colors lured me in. I absolutely love how the colors are placed on the garment. It defiantly gives it a "1960's" feel.

AH-29
Name, Major: Jill McNeece, Secondary Education/English
Project Title: *The Carnival Square: The Battlefield*
Faculty Advisor, Department: Eric Vivier, English, Gender Studies, and Shackouls Honor College
Project Type: Talk
Project Category: Arts and Humanities

Abstract: This paper reexamines the presence of carnival in William Shakespeare's 1 Henry IV by using Mikhail Bakhtin's suggestion that carnival is limited by time rather than space. Most critics' argument regarding 1 Henry IV and carnival has been almost entirely devoted to the canrivalesque nature of Falstaff. As a result of his grotesque and profane festivity, Falstaff has been crowned the mock carnival king and his kingdom, the tavern, framed as the carnival square. While this observation certainly has merit, this paper argues that carnival extends beyond the space of the tavern. Principally, this paper asserts a particular focus on identifying carnivalistic elements—the suspension of everyday rules, the breakdown of hierarchical barriers, the resulting shifts of relationships between people—at work on the battlefield and how the battlefield becomes a carnival square. The transformation of the battlefield to a carnival square is due in part to Falstaff's carnivalesque nature disrupting the honor and structure of the battle. As a result of Falstaff's presence, Hal's attempt to make the battlefield and his redemption characterize the purity of lent is complicated by carnival seeping beyond the tavern. Despite Hal's desire for separation, I argue that the overlap of carnival and lent becomes a cornerstone for his ability to unify the kingdom.

AH-30
Name, Major: Tom Melby, Landscape Architecture
Project Title: *Benthemplein Water Square: A Review of Sustainability Efforts*
Faculty Advisor, Department: Cory Gallo, Landscape Architecture
Project Type: Poster
Project Category: Arts and Humanities

Abstract: The city of Rotterdam is a low lying city in the dutch delta of the Netherlands (Maandag 2014). At such a low elevation, it has many stormwater management issues. Rotterdam is also next to the point where three rivers converge and empty into the ocean, making it even more susceptible to floods (Maandag 2014). Rotterdam recieves around two to three inches of rain a month (Maandag 2014). To deal with flooding issues, Rotterdam has a series of large dikes to keep water from spilling into the city. These dikes are becoming insufficient, however, and Rotterdam has spent two decades looking for new strategies of controlling the water (Maandag 2014). Rotterdam has since addressed its issues of stormwater management in one area with a full scale water square. Developed by a firm named De Urbanisten, the Benthemplein Water Square serves many functions. It contains several detention ponds for stormwater management, plants for environmental quality and population health, and serves the people of Rotterdam as a public park with interesting features (Dancing 2014). Construction on the water square was started in 2011 and finished in 2013 (Cake 2016). The square catches runoff from the surrounding area, including rooftops, temporarily holds it, then releases it either into the groundwater after being filtered or into the city's open water system (Dancing 2014). The water square also serves as a public space and offers a basketball court, skate park, and an ampitheater. The water square is a great asset to the Rotterdam community and serves many local businesses.

SS-32
Name, Major: Calyssa Middleton, Psychology
Project Title: *Prejudice Predicts Preference: An Examination of Sexual Racism in the South*
Faculty Advisor, Department: Dr. Hillary Sinclair, Psychology
Project Type: Poster
Project Category: Social Sciences

Abstract: Prejudice Predicts Preference: An Examination of Sexual Racism in the South Abstract: Interracial relationships have become increasingly prevalent (Wang, 2012). Yet evidence suggests that these relationships are still stigmatized (Gaines & Leaver, 2002). In this study, we surveyed 642 undergraduates (73% White, 25% Black; 67% female) at Mississippi State University to gain information about their history of dating interracially, as well as their willingness to date outside of their race. Only 11% of white participants confirmed having been in an interracial relationship, compared to 38% of black participants. There was no gender difference among white participants who had been in an interracial relationship; however, black males were the most likely to have dated outside of their race (45.3%). When asked about their willingness to date interracially, only 35.3% of white participants agreed that they would be willing, compared to 86.7% of blacks. A pre-screening survey included the Bogardus (1927) social distance scale (e.g., which measures beliefs about the separation of races). In an attempt to determine if prejudiced attitudes could predict dating preferences, we connected pre-screening and survey data. A significant interaction of Race and Social Distance was evident, but only for white participants. When white participants' desire for social distance between races was greater, they were less likely to express an interest in interracial dating. Thus, results support recent assertions that resistance to interracial dating may constitute a form of "sexual racism," at least among whites in Mississippi.

AH-31
Name, Major: Jane Mortimer, Human Sciences/Apparel Textiles and Merchandising
Project Title: *The Ornate Lace Dress*
Faculty Advisor, Department: Charles Freeman and Lori Neuenfeldt, Fashion Design and Merchandising
Project Type: Poster
Project Category: Arts and Humanities
Other Categories: Public Health

Abstract: The 1800s embody a spirit of elegance and poise. This intricate lace dress represents that spirit. Details such as dainty pink bows and ornate beige lace make this mid-calf length dress so unique. The simplicity of the construction of this garment along with the ornamental lace details crafts the most intriguing story. In the time period this dress originates, the 1890s, corsets were loosened and structure was pushed aside. There is not much information that this dress offers about its origin. The lack of labels and use of natural fibers refer back to the time period in which this dress was created. Considering these observations, there is still a missing piece of the puzzle. Therefore, in this case study, I will discover what type of woman wore this dress. I plan to research the price point of this garment to unveil the class and style of the woman that would wear this dress. I hypothesize that the wear and tear on the fabric, the discoloration on the hem, and the worn hook and eye clasps reveal that this garment has lived a purposeful life. The great detail in this garment lead me to believe that the owner was wealthy; therefore, I am performing this case study to solve the mystery of the ornate lace dress.

PSE-13
Name, Major: Maxwell Moseley, Industrial Engineering
Project Title: *Benefits and costs of implementing fuel treatments on nonindustrial private forest (NIPF) lands in Mississippi*
Faculty Advisor, Department: Hugh Medal, Industrial and Systems Engineering
Project Type: Poster
Project Category: Physical Sciences and Engineering

Abstract: This project focuses on the benefits and costs of implementing fuel treatments on nonindustrial private forest (NIPF) lands and is a collaboration with the College of Forest Resources. Analysis and sampling focuses on Mississippi, a fire-prone southern state that has a representative mixture of flammable vegetation and mixed ownerships. In regions with mixed ownership, the process of implementing and coordinating forest fuel treatments might be challenging due to the diversity of involved stakeholders, their differing forest management objectives, different perception of wildfire prevention costs and expected benefits, and risk aversion to wildfire occurrence. Through an examination of the cost structure associated with different treatment types and re-treatment intervals, we aim to determine least-cost re-treatment intervals that meet fire behavior objectives. In developing cost- and resource-effective fire prevention methods, we seek to encourage the adoption of these methods by NIPF landowners in order to decrease wildfire occurrence and impact and therefore minimize the costs of wildfire suppression. To this end, we simulate the effects of different fuel treatment strategies on these NIPF lands. These simulations also model the efficacy of government cost-share programs and simulate the allocation of resources needed to implement fuel treatments. Through these simulations, we develop an optimization algorithm to identify best fuel treatment strategies which can then be presented to NIPF landowners.

BSE-41
Name, Major: Jenna Mosier, Biological Engineering
Project Title: *Effects of Juvenile Chlorpyrifos Exposure on Novel Object Recognition in Adolescent Rats*
Faculty Advisor, Department: Russell Carr, Basic Sciences, College of Veterinary Medicine
Project Type: Poster
Project Category: Biological Sciences and Engineering

Abstract: Organophosphorus insecticides (OPs), such as chlorpyrifos (CPF), are widely used in agriculture in the United States. In previous studies, we have reported that developmental exposure to CPF alters the metabolism of the neuromodulatory endocannabinoids in the brain through the inhibition of fatty acid amino hydrolase (FAAH). Developmental CPF exposure has been hypothesized to lead to long term behavioral effects in children and exposure has been correlated with decreased cognition and attention deficit/hyperactivity disorder (ADHD). The goal of this study was to investigate the behavioral effects of developmental CPF exposure on adolescent rats. To investigate this, rat pups were orally exposed from postnatal day 10 (PND10) to PND16 to either corn oil, 0.5, 0.75, or 1.0 mg/kg CPF. An additional group was treated 0.02 mg/kg PF-04457845 (a specific inhibitor of FAAH) as a positive control. On PND34, rats were tested in a two-trial novel object behavioral test in which the time spent exploring objects in an open field was recorded. In the training trial, the two objects were identical but during the test trial, one object was replaced with a different novel object. During the training trial, both objects were explored equally by all treatment groups but the treated rats spent more time exploring than did controls. In the test trial, all treatment groups exhibited greater preference for the novel object. It appeared that the treated rats spent more time doing this than did controls but the discrimination indices were similar between the treatment groups indicating that of the time the animals spent exploring, a similar percentage involved exploration of the novel object. However, the treated animals spent more time exploring objects than did controls. These data suggest that while developmental inhibition of FAAH does not alter the response to novelty in adolescents, it does increase exploratory behavior.

SS-33
Name, Major: Jesse Newton, Human Sciences/Apparel Textiles and Merchandising
Project Title: *What not to wear*
Faculty Advisor, Department: Dr. Joe Wilmoth and Dr. Charles Freeman, School of Human Sciences
Project Type: Poster
Project Category: Social Sciences

Abstract: First impressions are crucial for success in the current job market. It is evident that there is a gap between what students wear and what employers expect from entry-level candidates. The bridge between industry managers and entry-level job applicants are faculty members and professors'; ensuring that they all share the same views on appropriate professional dress is vital. We plan to measure this by surveying students to better understand how students view and define dress. With the assistance of the Mississippi State Career Center, our survey will consist of images rated on their appropriateness for students to gage. On a numeric scale, participants will rate the images based on their views of appropriate attire. We will be able to analyze participants using this numeric scale by asking thorough questions about how the Social Identity Theory plays part in their outfit of choice decisions. Understanding said theory and also the "sixth sense theory" will help with understanding Social Influence in this study as it progresses. In this study, we anticipate reaching the conclusion that what students deem professional is not what employers are seeking.

BSE-42
Name, Major: Lydia Nunes, Microbiology
Project Title: *Quantitative Analysis of Retrograde Signaling in Select Rtg2p Mutants of S. Cerevisiae*
Faculty Advisor, Department: Donna Gordon, Cell Biology
Project Type: Poster
Project Category: Biological Sciences and Engineering

Abstract: In Saccharomyces cerevisiae, dysfunctional mitochondria can initiate a mitochondria-to-nuclear signaling cascade known as retrograde signaling. This pathway offers a means to compensate for mitochondrial deficiencies by initiating the transcriptional upregulation of select genes, such as CIT2, a peroxisomal isoform of citrate synthase. CIT2 expression is regulated by the activity of several cytosolic proteins including Mks1p, Rtg1p, Rtg2p, and Rtg3p. Rtg2p functions as the cytosolic sensor that, when bound to Mks1p, allows the Rtg1p/3p complex to enter the nucleus. Nuclear localized Rtg1p/3p then functions as a transcriptional activator for select genes incl uding CIT2. Using a random chemical mutagenesis approach, our lab has generated four RTG2 mutants that exhibit reduced retrograde signaling. To expand on the qualitative differences in Rtg2p signaling identified through the use of growth on selective plates, quantitative data was obtained using classic promoter driven β-galactosidase liquid expression assays. For these studies, the β-galactosidase gene, lacZ, was placed under the CIT2 promoter in strains that expressed each of the Rtg2p mutations. Cells were grown in non-inducing (+ glutamate) and inducing (-glutamate) conditions and the impact of each mutation on Rtg1p/3p transcription was quantified. For analysis, β-galactosidase activity was normalized to the wild-type Rtg2p expressing strain under non-inducing conditions. Data indicate that β-galactosidase activity for all but one rtg2 mutant was below the level of detection, consistent with the observed defects in growth on selective plates. In the future, more sensitive methods (e.g. qPCR) will be needed to detect differences in transcriptional activities between these four mutants.

BSE-43
Name, Major: Chris Nutter, Biochemistry
Project Title: *A link between actin and S. cerevisiae susceptibility to occidiofungin*
Faculty Advisor, Department: Donna M Gordon, Biological Sciences
Project Type: Poster
Project Category: Biological Sciences and Engineering

Abstract: Occidiofungin is a non-ribosomally synthesized peptide secreted by Burkholderia contaminans MS14 shown to have cidal properties against various fungi including Saccharomyces cerevisiae. Prior work indicates that occidiofungin has a mode of action different from current antifungals, however the biological target remains to be identified. Recent work suggests that exposure to occidiofungin may alter the yeast cytoskeleton. Based on this finding, we are interested in examining the importance of actin in S. cerevisiae sensitivity towards occidiofungin. As actin is essential for cell viability, we focused on various actin-binding proteins. Minimum inhibitory concentration (MIC) assays were carried out using strains deleted for genes that code for various actin-binding proteins. Of the mutants tested, only Δtpm1 was shown to have altered susceptibility to occidiofungin, resulting in a 4-fold resistance profile compared to a wild type strain. S. cerevisiae contains two highly conserved tropomyosin genes, TPM1 and TPM2. Whereas disruption of TPM2 has little effect on actin cable structure, tpm1 mutants lack visible actin cables. Tropomyosin-actin interaction has been shown to be regulated by acetylation of Tpm1, an activity carried out by Nat3p, the catalytic subunit of the NatB acetyltransferase enzyme. Interestingly, nat3 deletion mutants have been shown to have reduced actin cables. To further investigate the role of these proteins in occidiofungin sensitivity, serial dilution spotting assays and cell viability by colony forming unit (CFU) assays were carried out. Similar to the MIC data, spotting assays and CFU measurements found that deletion of tpm1 resulted in resistance to occidiofungin. However, cells deleted for NAT3 showed an increased susceptibility to occidiofungin when analyzed by CFU. To determine the impact of occidiofungin on actin cable formation in these mutants, F-actin will be visualized using rhodamine-phalloidin microscopy. Results from this work will be used to inform approaches aimed at identifying the biological target of occidiofungin.

SS-34
Name, Major: Erin O'Quinn, Mechanical Engineering
Project Title: *ADHD Risk as Predicted by Parental Time at Work*
Faculty Advisor, Department: Dr. Torri Jones, Psychology
Project Type: Poster
Project Category: Social Sciences

Abstract: Studies have consistently concluded that socioeconomic status (SES), is linked to Attention-Deficit/Hyperactivity Disorder (ADHD) in children. One important aspect of SES was the amount of hours parents spent working. The intent of the present study is to compare amount of presenting ADHD symptoms in children whose parents work various hours. Participants were 396 girls and boys 6-18 years of age. Methods involved the use of a collaborative diagnostic team (including a licensed clinical social worker, a licensed clinical psychologist, and a board certified psychiatrist) that generated Best Estimate Diagnoses based on reviews of the Kiddie Schedule for Affective Disorders and Schizophrenia (KSADS), the Diagnostic Interview Schedule for Children (DISC), and self-, parent-, and teacher-ratings. Overall, 53% of the participants were diagnosed with ADHD while the remaining 47% were used as a comparison group. Parents provided the number of hours they spent working and yearly income on a demographic questionnaire. It is predicted that parents who work more hours will have children who present higher levels of ADHD symptoms than those who work less. The results will aid in increasing our understanding of predictors of ADHD risk, which will in turn have significant implications for prevention and intervention.

AH-32
Name, Major: Emily Owens, Agricultural Information Science
Project Title: *An Investigation in Women's Outdoor Apparel*
Faculty Advisor, Department: Catherine Black, Fashion Design and Merchandising
Project Type: Poster
Project Category: Arts and Humanities

Abstract: Agriculture is recognized as a male dominated field, when in fact women make up almost half of the industry world-wide. The industry is comprised of 43% women (SOFA, 2011). These women are typically wearing clothing designed to withstand the elements and environments with which they are working. Not only are women who work in the agriculture industry in demand of outdoor clothing, but women who take on recreations in the outdoors such as skiing, hunting and fishing are as well (Merrill, 2015). The outdoor clothes industry is a $4 billion industry and rising (Chavie, 2014). The researchers found little research regarding women's satisfaction with outdoor clothing, and there is little evidence reported on the clothing needs of women wearing outdoor clothes. Therefore, the purpose of this study was to investigate the clothing needs of women who work or spend recreational time in the outdoors. Data were gathered by an online survey using Qualtircs. The survey evaluated the goals of the study by investigating the usage of clothing made for the outdoors, and time spent utilizing outdoor clothing. In addition, this study also investigated the most important attributes when purchasing outdoor clothes (pre-purchase), and the level of satisfaction with garments previously purchased (post-purchase). Questions were also asked to identify needs related to specific garments. The sample was obtained from the online group: Women in Agriculture. Data is currently being obtained.

AH-33
Name, Major: Sara Peppers, Landscape Architecture
Project Title: *High Point: A Review of Sustainability Efforts in West Seattle's New Redevelopment Neighborhood*
Faculty Advisor, Department: Cory Gallo, Landscape Architecture
Project Type: Poster
Project Category: Arts and Humanities

Abstract: The High Point Redevelopment in Seattle, Washington is currently one of the largest projects of its kind. With more green infrastructure and mixed-income housing than any other development around, this neighborhood is renowned for its exceptional incorporation of sustainable practices throughout all phases of the design and construction. Through the partnerships of the Seattle Housing Authority, the city of Seattle, and other public and private interests, this project was able to take form and become what it is today: a grand beacon for socially, economically, and environmentally sustainable neighborhood development. A framework of New Urbanist design principles led the design of the High Point in such a way to create inclusive, livable neighborhoods through mixed land use, diverse transportation infrastructure, and human-scale design principles. With nearly 1,700 new housing units on the 120-acre site, the redevelopment of High Point replaced roughly 750 public housing units from the 1950s (these had replaced the 1940s housing for defense workers). These new units catered to a diverse group of people, including very low-income, low-income, senior, and market rate units. Other community amenities included in the development include a library, medical and dental clinic, community center, and community gardens. Awarded with a HOPE VI grant, redevelopment plans for High Point were able to get started, with other funding coming soon after, with a total of $550,000,000 being invested to date (HUD 2012).

BSE-44
Name, Major: Madilyn B. Petty, Biological Sciences/Biological Sciences
Project Title: *Branchial and Spiracular Drainage Tubes of Tadpoles with a Sinistral Spiracle*
Faculty Advisor, Department: Ronald Altig, Biological Sciences
Project Type: Poster
Project Category: Biological Sciences and Engineering

Abstract: The spiracle(s) of anuran tadpoles is the exit port for water that is pumped in through the mouth by the buccopharyngeal apparatus. This route must be present for a tadpole to irrigate the gills and capture food items. There are three configurations: (1) single spiracle that occurs in the majority of taxa somewhere left of the ventral midline (i.e., sinistral) and drained by the branchial drainage tube from the left branchial chamber, (2) a single spiracle positioned on the midventral line directly posterior to the oral disc, near the center of the belly, or near the vent, and (3) dual and ventrolateral spiracles. We dissected and photographed specimens of five species of tadpoles with sinistral spiracles: the hylid Dryophytes chrysoscelis, the ranids Lithobates catesbeianus of the L. catesbeianus group, L. palustris of the L. pipiens group, and the scaphiopodids Spea bombifrons and S. hammondii. We verified the confusing morphology of the route of water from the right to the left branchial chamber and from the left branchial chamber to the outside. With considerable variations in size and width, all of the tadpoles had a opercular canal (Fig. 1A-E) between the right and left branchial chambers. This thin--walled, nonpigmented tube is positioned just anterior of the transverse septum and directly above the skin. The spiraular drainage from the left branchial chamber is not a simple port in the left branchial chamber. The tube that drains the left branchial chamber is wide at its origin, and it narrows in variable patterns as it extends to the spiracular opening. With these anatomical structures verified, we plan to do developmental studies of embryos to determine what causes the differences in spiracle location.

BSE-45
Name, Major: Will Prevost, Agricultural Engineering Technology & Business
Project Title: *Determining Mid-Season Nitrogen Rates with NDVI Technology*
Faculty Advisor, Department: Joby Czarnecki, Plant and Soil Sciences
Project Type: Poster
Project Category: Biological Sciences and Engineering

Abstract: Nitrogen fertilizer alone controls about 22% of the total cost involved in producing a corn crop. As a result of this, producers should be motivated to apply nitrogen as efficiently as possible. Variable Rate Application (VRA) technology has increased the efficiency of nitrogen application in recent years, but it is not a perfect practice. VRA of nitrogen is typically applied based on yield data from previous years. This is not a very accurate way to do this, as there are many factors to go into total yield other than nitrogen input. This study was conducted to determine if Normalized Difference Vegetative Index (NDVI) values could be used as a viable reference point for variable rate nitrogen application. NDVI values were obtained from multi-spectral aerial images of corn fields in the V5-V6 vegetative stage near Yazoo City, MS. In an attempt to create a simple index for converting NDVI values to a VRA map, we calculated the cost of giving the above average half of the field a fixed rate of N, with each standard deviation below average receiving 12.5% more nitrogen. This method offered a savings of $16 per acre, almost 18%, over a traditional blanket application. There are still some problems with this method. Low NDVI values can be a result of several factors other than nitrogen deficiency, such as water stress, change in soil type, micronutrient deficiency, and others. There is potential for savings using this method but the process needs to be further refined.

PSE-14
Name, Major: Cody Price, Chemistry
Project Title: *Toward a Molecular Mechanism of Self-Association in Elastin-Like Proteins*
Faculty Advisor, Department: Nicholas C. Fitzkee, Chemistry
Project Type: Poster
Project Category: Physical Sciences and Engineering

Abstract: Elastin-Like Proteins (ELPs) have been proposed as a novel drug delivery vector for treating cancer. These proteins aggregate reversibly above a specific temperature, allowing ELPs to be thermally targeted to cancerous tumors. Though proven successful in mouse models, without a molecular understanding of how ELPs aggregate, it remains extremely difficult to optimize these molecules for drug delivery in humans. Microscopic examination of the ELPs at elevated temperature suggests that liquid-liquid phase separation is occurring above the transition temperature (TT). Previous studies suggested that, as temperature increases, ELPs experience an increased propensity for type II β-turns. Our hypothesis is that the interaction is initiated at the β-turn positions. Using dynamic light scattering, Nuclear Magnetic Resonance Spectroscopy (NMR), and Paramagnetic Relaxation Enhancement (PRE), we have characterized structural properties of self-association in our ELPs. NMR chemical shifts suggest that ELPs adopt a β-turn conformation even at temperatures below TT. The intermolecular PRE reveals there is a stronger interaction between the middle regions of sequence (A84 vs. A84) than other interactions involving the N/C termini. Together, these observations suggest a model where ELP self-association is initiated at β-turn positions in the center of the protein sequence. Even though the sequence is highly repetitive throughout, this behavior might be explained by fraying of β-turns at the N- and C-termini, giving these regions a lower propensity for initiating the interaction.

BSE-46
Name, Major: Bianca Quade, Biochemistry
Project Title: *Step aside, Brita: Applications of Biochar in Agricultural Waste Water Remediation*
Faculty Advisor, Department: Ashli Brown, Biochemistry and Molecular Biology
Project Type: Poster
Project Category: Biological Sciences and Engineering
Other Categories: Community Engagement, TRC

Abstract: Agricultural wastewater is widely used to water crops, and in many parts of the world due to water scarcity it is necessary to keep crops viable. Agricultural waste water is a complex mixture and needs to be treated to ensure contaminants are not introduced to the environment. The idea of integrating biochar into this process stems from its ability to adsorb compounds like phosphate. One could expose the water to the char, bind the phosphate, and reincorporate the slurry into the soil. Three benefits arise from this: plants get water, phosphate is sequestered in the soil with reduced chances for run-off, and biochar acts as an added carbon and oxygen source for the plants. In this study, biochar from Black Owl Biochar was used and modified with different amounts of magnesium and aluminum cations to produce a low cost adsorbent to remove phosphate from local chicken farm lagoon water. Batch adsorption studies were performed with varying concentrations, temperatures, competitive ions, and time intervals to optimize phosphate adsorption and to study the adsorption kinetics of phosphate in water. The total amount of phosphate adsorbed was determined quantitatively using Ion Chromatography. Batch adsorption experiments indicated that, compared to unmodified biochar, the Mg/Al-modified biochar showed enhanced removal of phosphate from waste water, suggesting that the modification of biochar with Mg/Al generates different sites for phosphate adsorption. This work proves that a combination of biochar with Mg/Al, which are largely available and can be generated from fairly inexpensive materials, can be used as an effective adsorbent to remove phosphate from aqueous solution. Further research of the effects of the treated biochar on soil quality as well as the effects of more complex competitive ions will need to take place to ensure the viability of biochar as an inexpensive water treatment option for farmers worldwide.

AH-34
Name, Major: Haley Ransom, Human Sciences/Apparel Textiles & Merchandising
Project Title: *Hunting History: The Livery Jacket*
Faculty Advisor, Department: Lori Neuenfeldt and Charles Freeman, School of Human Sciences
Project Type: Poster
Project Category: Arts and Humanities

Abstract: In most cases, fashion is a way to convey status. The livery suit was a symbolic uniform commonly worn to display the relationship between an owner and their servants. Although elaborate livery suiting was custom in European countries, the fashion became highly popular during colonial America. Owned by the Mississippi State University Historic Costume and Textiles Collection, the livery jacket is an important chapter in the story of American culture. Through visual investigation and object comparison, research data suggests the jacket may be an example of American livery dating to the nineteenth century. The jacket is made with blue and red wool with floral embroidery. Livery buttons molded with emblems of dogs, a wolf, and a stag adorn the garment which indicates that the garment may be hunting livery. However, we do not know if the livery jacket has been altered or remains in the original state. The purpose of this study is to discover the untold story of the jacket through close observation and analysis of the garment and comparable objects. It is believed that this garment was worn by a male during peak hunting season in the southeastern region of the country.

BSE-47
Name, Major: Joey Reed, Biochemistry
Project Title: *Using an in vitro model to investigate food insecurity in the United States*
Faculty Advisor, Department: Renita Horton, Agriculture and Biomedical Engineering
Project Type: Poster
Project Category: Biological Sciences and Engineering

Abstract: Food insecurity proves a growing concern in the United States. Food insecurity is the state of being without a consistent access to sufficient quantity of affordable, nutritious food. This generally translates to a nutrient deficiency which can contribute to heart disease, hypertension, or diabetes. A survey conducted by the USDA found that 12.7% of U.S. households were food insecure at some time during 2015. In Mississippi, approximately 21% of households are affected by food insecurity. In addition to leading in food insecurity, approximately 25% of Mississippians die from cardiovascular related diseases every year. Coupling these statistics led us to question the potential links between nutrient deficient diets and vascular related diseases. The goal of our study is to examine the role of nutrient deficiency on vascular health. We will design, build, and test an in vitro model to investigate the link between the food insecurity and vascular related complications.

AH-35
Name, Major: Jordan Reynolds, Human Sciences/Apparel Textiles & Merchandising
Project Title: *Yves Saint Laurent Chooses Ready-To-Wear*
Faculty Advisor, Department: Lori Neuenfeldt, Art
Project Type: Poster
Project Category: Arts and Humanities

Abstract: This research pertains to a Yves Saint Laurent Rive Gauche blouse that originated in approximately 1978 or 1979. This particular blouse was a part of Yves Saint Laurent's Rive Gauche line. The first line of "Saint Laurent Rive Gauche" was introduced in 1966 in Saint Laurent's first ready-to-wear boutique in Paris, France. Before this, no other couture designer had ever launched a ready-to-wear option for it's consumers. This resulted in immediate success and a new sanctum of youth culture in Paris. With the creation of Rive Gauche, Saint Laurent developed the idea of wardrobe "essentials". He gave women the option to choose separates that they could mix and match in what seemed like endless combinations. Designing his ready-to-wear along the same lines as his couture pieces allowed Saint Laurent to reach a wider audience. Throughout the 1970s, Saint Laurent continued to present his fashion through his ready-to-wear line, resulting in great success in the years to follow. Throughout the 1970s, blouses of this style and fit were a huge trend that people of all social classes and ages took part in. This blouse is made with one hundred percent silk in a peasant-like silhouette. The neckline is scoop neck and features a triangular keyhole detail. Although the blouse is slightly discolored due to UV exposure, and there are several stains caused by an unknown substance, it remains in good condition. Its most eye-catching characteristic lends itself to the cornflower blue color and pattern of the fabric. Photographs of the garment, along with details of its history, will be included in the poster portion of this research.

AH-36
Name, Major: Patrick Ritchey, Landscape Architecture
Project Title: *Bo01 Sustainability: Malmo, Sweden*
Faculty Advisor, Department: Cory Gallo, Landscape Architecture
Project Type: Poster
Project Category: Arts and Humanities

Abstract: Bo01 is a district inside the swedish town of Malmo. What began as a housing exhibition for sustainability, soon became a real town where people live today. This poster covers the social, economic and environmental sustainability of Bo01. The social sustainability covers aspects such as community, transportation, and the health of the city. the economic sustainability covers the types of buildings as well as the types of business. Lastly, the economic sustainability covers stormwater, waste, and energy of the site.

PSE-15
Name, Major: Jamarii Robinson, Chemical Engineering
Project Title: *Molecular Dynamic Investigations of Phosphonium as a Phase-Separable Solvent in Chemical Processes*
Faculty Advisor, Department: Neeraj Rai, Dave C. Swalm School of Chemical Engineering
Project Type: Poster
Project Category: Physical Sciences and Engineering

Abstract: Recent studies have demonstrated the potential of certain ionic liquids as solvents for chemical processes. Phase-separable ionic liquids can dissolve varying compounds and co-solvents while its hydrophobic nature allows it to separate easily from aqueous solutions. Phosphonium is an ionic liquid whose hydrophobic nature appears to increase relative to its length of alkyl chains. This study will involve producing molecular dynamic simulations of varying species of phosphonium molecules to study its characteristics in chemical processes.

BSE-48
Name, Major: Benjamin J. Rushing, Biological Engineering
Project Title: *AGE/RAGE Signaling in Diabetes-Mediated Vascular Calcification in Adventitial Fibroblasts*
Faculty Advisor, Department: James A. Stewart, Jr., Biological Sciences
Project Type: Poster
Project Category: Biological Sciences and Engineering

Abstract: Type II diabetes mellitus has been a highly studied and prevalent pathology especially in the state of Mississippi. The implication of Advanced Glycation End-Products (AGEs) and their receptor, Receptor for AGEs (RAGE), has also been identified. Diabetic patients experience a higher level of cardiovascular complications than the general population, particularly vascular calcification. Vascular calcification has been demonstrated to occur in the arterial medial layer; however, the adventitial layer, once thought to be a static layer composed of fibroblasts and nerve endings, has been shown to play a dynamic role in vascular function. Fibroblasts are responsible for the underlying extracellular matrix and serve as progenitor cells for myofibroblasts. When vascular injury occurs, the fibroblast undergoes a phenotypic switch to myofibroblasts where they can travel to the site of injury and continue to excrete a matrix to support cell attachment. Fibroblasts and myofibroblasts are investigated in a variety of diseases and have been implicated in vascular calcification. The purpose of this research is to elucidate the role of adventitial fibroblasts in diabetes-mediated vascular calcification. Primary mouse adventitial fibroblasts of non-diabetic (HetRWT) were isolated and placed in conditioned media from vascular smooth muscle cells in a diabetes-mediated vascular calcification cell culture model. Western blotting analysis revealed increased smooth muscle actin (SMA) expression, a myofibroblast marker, in HetRWT cardiac fibroblasts exposed to conditioned calcification media for 24-hours. Thus, demonstrating a potential positive correlation between RAGE expression, vascular smooth muscle secretagogues, and changes in adventitial fibroblast phenotype to a myofibroblast.

PSE-16
Name, Major: Joshua Russell, Electrical Engineering
Project Title: *Suitable Controls Techniques for Driving in Loose Soils*
Faculty Advisor, Department: Christopher Archibald, Computer Science and Engineering
Project Type: Poster
Project Category: Physical Sciences and Engineering

Abstract: Robotics allows man to accomplish tasks that would otherwise be too dangerous or difficult to complete. For instance, the Martian rovers traverse the Martian landscape, a place that is currently too far and dangerous for man to travel. But Mars is not the only environment where wheeled robots tackle this issue, as there are plenty of landscapes on Earth that pose engineering challenges. There are countless terrains that a wheeled robot encounters. One important aspect of ensuring that these robots can drive through irregular areas is controls, specifically low level motor controls. There is a disconnect between what the higher-level algorithm desires the robot to do and what it will actually do based on the real-world. The solution to this disconnect is controls. Improper controls techniques can lead to devastation for the robot. The robot could deviate too far from the desired path or velocity. The robot could also sink into the soil and even become immobile. Here, the industry standard PID controller is used to control the velocity of the wheels on a differential drive robot. It is tested to see how well it performed through loose simulant. The PID controller parameters were found using a common heuristic technique. Although this technique may typically work for a differential drive robot on a harder surface, the results from loose soil demonstrated that the PID controller causes excessive wheel slippage, which increases the probability of the robot sinking and becoming immobile. Other possible solutions could come in the form of a different tuning technique, a different controller type, or some step away from velocity control altogether. A mathematical model of the motor's step response was attempted to be found using a tested technique.

AH-37
Name, Major: Caroline Salley, Human Sciences/Apparel Textiles and Merchandising
Project Title: *Pat Hartly Day Dress*
Faculty Advisor, Department: Charles Freemand and Lori Neuenfeldt, School of Human Sciences
Project Type: Poster
Project Category: Arts and Humanities

Abstract: The “old Hollywood”, classic day dress was worn by housewives and could even be seen on influential fashion figures such as Queen Elizabeth II and Jacqueline Kennedy Onassis. The Pat Hartly dress is a staple of fashion from the 1950s and can automatically be related to those years once seen. Trademarked in the U.S. in the early 1940s, this silhouette was seen mostly in the 1950s. This navy blue, brown, and beige floral print dress is in fairly good condition besides a few stains, and it is missing a key piece in the belt. However, we cannot find a reliable source to gather all the information needed to identify who Pat Hartly is exactly. The silk dress has only been found through Esty accounts that are reselling them but more information is available if you look in the correct places and have the right resources. Therefore, the purpose of this case study is going to help us find a reliable source to determine whom Pat Hartly is and what she was trying to accomplish with this style dress. This can be done by taking advantage of resources such as the Internet and the documents that are provided for us. Through this study, we are hoping to find more detailed history of the style, who Pat Hartly is, and the importance of the dress in the 1950s.

BSE-49
Name, Major: Mariana Santana, Biological Engineering
Project Title: *Male giant pandas demonstrate physiological responses to chemosensory molecules in female urine*
Faculty Advisor, Department: Dr. Darrell Sparks, Biochemistry
Project Type: Poster
Project Category: Biological Sciences and Engineering

Abstract: Giant pandas depend on urinary chemical communication to signal breeding cycles. Female pandas typically undergo estrus once per year in the spring, during which they are most fertile for up to three days. Because this window of sexual receptiveness is so short, it is essential for males to respond to compounds in female urine that signal the estrus period. Four compounds have been isolated in female giant panda urine that appear to correlate with estrus: octanoic acid, 1H-Pyrrole-2-carboxaldehyde, decanoic acid, and (Z)-9-Cycloheptadecen-1-one. We hypothesized that exposure to these four compounds will elicit a physiological response in male giant pandas. This was investigated by measuring changes in urinary volatile profile composition and urinary testosterone metabolite concentration. Male giant pandas housed at the Memphis Zoo, San Diego Zoo, and Zoo Atlanta were exposed to the compounds listed above during both the breeding (n=2) and nonbreeding seasons (n=2). Urine samples were collected prior, during, and after the completion of the trials. Volatile compounds were extracted using solid phase micro-extraction and were analyzed using a gas chromatograph mass spectrometer. Compounds were tentatively identified with an 80 match factor, occurred in at least 10% of samples, and were present in all subjects (n=2) per season, resulting in thirteen compounds during breeding season and seven compounds during nonbreeding. The concentration of testosterone metabolites was determined using a single antibody competitive enzyme immunoassay. Testosterone concentrations are expected to increase when males were exposed to specific compounds. Both an increase in the abundance of urinary volatile compounds and an increase in testosterone concentration may indicate which compounds signal estrus conditions to male pandas. Eliciting male physiological responses through the use of pheromone candidates found in this study could assist zoos and breeding programs in identifying the optimal time frame for successful breeding.

BSE-50
Name, Major: Abbey Schnedler, Animal and Dairy Sciences
Project Title: *Effects of Extended Retail Display on Aerobic Bacterial Counts and Metmyoglobin Reducing Activity in Ground Beef*
Faculty Advisor, Department: Thu Dinh, Animal and Dairy Sciences
Project Type: Poster
Project Category: Biological Sciences and Engineering

Abstract: Ground beef is the most consumed meat product in the U.S. However, it has a short shelf life of 3 to 5 d. The authors of the current study observed an increase in lean redness and percentage of oxymyoglobin in ground beef after 5 d of retail display, in contrast to conventional wisdom that beef color continues to deteriorate as retail display progresses. The objective of this study was to evaluate the effects of extended retail display on aerobic plate count (APC) and metmyoglobin reducing activity (MRA) of ground beef. Two retail display trials were conducted using two ground beef batches with 91% and 93% lean. Thirty---six 454---g ground beef loaves per trial were produced, placed on black Styrofoam™ trays, overwrapped with PVC film (O2 permeability of 1.21 mL/cm2/d and water vapor permeability of 0.022 g/cm2/d; LINPAC Packaging---Filmco Inc., Aurora, OH), and displayed at 2°C under fluorescent light (900 lux) for up to 13 d. Two randomly selected loaves at each of 18 sampling times in each trial were withdrawn for analyses of MRA by reflectance spectrophotometry and APC by 3M APC Petrifilm™ (3M Corporation, St. Paul, MN). The GLIMMIX procedure of SAS (SAS Institute Inc., Cary, NC) was used for statistical analysis at 0.05 level of significance. The APC was increased from d 0 (3.1 log CFU/g) to d 7 (3.8 log CFU/g; $P = 0.022$). The MRA remained similar ($P \geq 0.220$) from d 0 to d 5 (7.03 to 8.58 μM/min/g). However, compared with d 5, MRA was increased on d 6 (9.83 μM/min/g; $P = 0.027$), up to d 13 (16.01 μM/min/g; $P \leq 0.004$). This discovery potentially leads to applications that enhance shelf life of ground beef and reduce economic loss of muscle foods.
Keywords: ground beef, myoglobin, metmyoglobin reducing activity, aerobic bacteria, beef color

BSE-51
Name, Major: Aumbriel Schwirian, Biochemistry
Project Title: *Multiple Paternity in Cyclura nubila caymanensis*
Faculty Advisor, Department: Dr. Mark Welch, Biological Sciences
Project Type: Poster
Project Category: Biological Sciences and Engineering

Abstract: Polyandrous mating is a system in which the female mates with multiple males, often resulting in multiple-paternity (MP). This type of system may arise to provide a different combination of benefits, depending on the taxa it arises in, such as increased reproductive success of competitive males or enhanced offspring genetic diversity. Inbreeding avoidance strategies such as polyandrous mating may evolve to optimize outbreeding when close kin cannot be distinguished. Females of certain taxa are capable of storing sperm from multiple males. This may promote post-copulatory control over reproductive outcomes. While analyzing controlled laboratory crosses with known pedigrees has contributed much to the study of MP, studying it in the wild is much more difficult due to lack of known pedigrees, random (and often unknown) matings, and small offspring sample sizes. Highly polymorphic molecular markers provide tools with which to reconstruct individual genotypes within a population and overcome pedigree reliance. Using multiple microsatellites allows us to differentiate individuals with high probability. Because microsatellites are prone to mutations, likelihood methods that employ many markers simultaneously and incorporate prior knowledge of relationships are expected to be the most informative. Cyclura nubila caymanensis, more commonly known as the Sister Isles Rock Iguana (SIRI) is a critically endangered taxon endemic to two of the Cayman Islands: Cayman Brac and Little Cayman. Of these two populations, only the Little Cayman population (of ~2,000 - 4,000 individuals) has the potential to remain viable. Keeping this population both viable and thriving is critical to the islands' ecology, due to SIRI's role as seed dispersers. Seventeen whole clutches were sampled in 2015, 6 of which have known mothers. To determine sibships and parentage of the clutches, multilocus genotypes were constructed from 17 microsatellite loci for a total 146 hatchlings, 75 adult females, and 23 adult males. Determining if SIRI has a significant degree of inbreeding and polyandrous mating will be crucial to guiding future management strategies and predicting how the population could respond to future reductions in size. Studying polyandrous mating may also provide insight into how other geographically isolated systems evolve mating strategies.

AH-38
Name, Major: Madison Sessions, Human Sciences/Apparel Textiles and Merchandising
Project Title: *Roaring on the river*
Faculty Advisor, Department: Charles Freeman, Apparel, Textiles, and Merchandising
Project Type: Poster
Project Category: Arts and Humanities

Abstract: A striking chord is made when the Mississippi Delta is paired with the decade of the 1920s. Both are rich in inspiration, history, and impact. The warm Delta being a place of old ways and striking natural beauty, while the energetic 1920s being a time of drastic change. While fashion trends of the decade were staged on a global and sometimes scandalous scale, the people of the Mississippi delta, being deeply rooted in their heritage, tailored the trends to their region. The dress I am researching embodies so much of this combination of embracing what is new, but staying true to the roots of a specific society. The soft, conservative dress is handmade from an off-white woven cotton fabric that is ideal for the Mississippi humidity. The subtle Mississippi influences are framed in the boxy, square structure that represents the style of the 1920s that was made famous by Chanel. The simple, delicate embellishments are formed by geometrical shapes arranged symmetrically on the dress. However, we do not know who made it, why it was made, and when it was used. The purpose of this study is to discover the factors from the decade and region that could have been influences for why it was made and how it was used. I hypothesize that it was frequently worn by the maker and was used daily.

AH-39
Name, Major: Tiana Shaffer, Human Sciences/Apparel Textiles and Merchandising
Project Title: *A Study of Economic Influence on Fashion*
Faculty Advisor, Department: Charles Freeman, Apparel Design and Merchandising
Project Type: Poster
Project Category: Arts and Humanities

Abstract: Global economic stability has been instrumental throughout the history of fashion. The garment is a black jacket constructed from a synthetic textile with tulle sleeves and detailed trims. The jacket is a ready-to-wear garment from the early 1900's. However, what is undetermined is the specific year the style was created, and the inspiration of the design during the period. The purpose of this case study is to determine what year the garment was made, as well as the global economic influence of the silhouette and whether it had an impact on the design. I hypothesize that based on the jacket's details that the economy was stable, which was reflected through the detailed trims and unique textile used to construct this jacket.

SS-35
Name, Major: Anna Smith, Psychology
Project Title: *Religiosity and Forgiveness in Custodial Grandchildren and Foster Children: Moderation by Gender*
Faculty Advisor, Department: Dr. Danielle K. Nadorff, Psychology
Project Type: Poster
Project Category: Social Sciences

Abstract: Previous research has demonstrated the beneficial role of forgiveness as a form of psychotherapy, resulting in improved physical and mental health, as well as increased life satisfaction. Moreover, religiosity and forgiveness have been shown to be positively correlated, both within the general population and within specific religious denominations. However, these factors have not yet been examined in the growing population of former "custodial grandchildren" (people raised by their grandparents), nor foster children, both of whom experience more trauma and stress, on average, than their peers, and report higher levels of mental and emotional problems. The current study evaluated the relation between religiosity and forgiveness in a population of 278 adult custodial grandchildren and foster children, recruited via Amazon's MTURK service, with IRB approval. Participants were asked to complete the Stearns-McKinney Assessment of Religious Traits scale (SMART), the Heartland Forgiveness Scale (HFS), the Factors Related to Forgiveness Inventory (FRFI), a question measuring religious service attendance, and demographic information, via an online survey. Results indicated that religiosity significantly predicted forgiveness levels. Furthermore, gender moderated the relation between religiosity and forgiveness, such that religiosity was more strongly correlated with forgiveness for males than for females. However, there were no significant gender differences in forgiveness levels or religiosity, apart from women spending significantly more time in private religious activities, such as prayer, meditation, or Bible reading, than men. Interpretations, limitations, and implications for intervention are discussed.

BSE-52
Name, Major: Callie Smith, Agronomy
Project Title: *Applied Use of Unmanned Aerial Systems for Soybean Harvest Aid Applications*
Faculty Advisor, Department: Joby Czarnecki, Plant and Soil Sciences
Project Type: Poster
Project Category: Biological Sciences and Engineering

Abstract: The purpose of this research project is to apply the use of unmanned aerial systems (UAS) to evaluate timing of harvest aid applications in soybeans. The use of UAS in for this purpose could allow the producer to have a more objective way of determining when late-season harvest aids can be applied safely without risking yield loss. Current methods involve visual survey of a limited portion of a production field; UAS would allow a producer to more rapidly survey the entire field. Five harvest aid mixtures were applied at three different maturity stages, R6, R6.5, and R8, for a total of 15 treatments. Each treatment was replicated four times. Flights were conducted over the study field approximately every three days with a small, unmanned multi-rotor aircraft equipped with a multispectral sensor payload. Image data from the sensor provided data necessary to calculate key vegetation indices, normalized difference vegetation index (NDVI) and normalized difference red edge (NDRE). Using GIS software, plot boundaries were used to extract index values. Yield data were combined with NDVI and NDRE values to analyze data collected using zonal statistics. Field data were taken to rate the maturity of each plot at application time, and the progression of maturity over time within the plot. The results of this study can help Mississippi soybean producers determine how to use UAS as a tool for optimizing timing of harvest aid application based on more objective measures of maturity, allowing producers to increase their efficiency and incorporate new technologies.

BSE-53
Name, Major: Ciarra Smith, Biochemistry
Project Title: *Role of Nurr1 in amphetamine conditioned place preference*
Faculty Advisor, Department: Dr. Jeffrey Eells, Basic Science Department, College of Veterinary Medicine
Project Type: Poster
Project Category: Biological Sciences and Engineering

Abstract: Addiction is defined as a chronic, relapsing disease that involves compulsive seeking behavior and use of a substance that has detrimental consequences. Drug addiction is a common health problem with an estimated 27 million people suffering from some form of this abuse (UN-ODC, 2015). Amphetamine is one such drug of abuse that stimulates the release of dopamine into the synapse by binding to the dopamine transporter (DAT), reversing the function of DAT and causing it to transport dopamine molecules back into the synapse. The transcription factor Nurr1 is also important for the regulation of both tyrosine hydroxylase, a precursor to the dopamine neurotransmitter, and DAT; therefore Nurr1 has a large effect on the regulation of dopamine levels in the brain. Because Nurr1 can regulate dopamine neurotransmission genes and ultimately dopamine levels and is altered with amphetamine treatment, our hypothesis is that the increase in Nurr1 expression associated with amphetamine is critical for the changes in dopamine neurotransmission that signal rewarding effects of amphetamine. To test this hypothesis, this study looked at the role Nurr1 plays in amphetamine stimulation in conditioned place preference (CPP) by comparing effects in wild-type mice and Nurr1-null heterozygous mice. Our results found that Nurr1-null mice displayed a greater conditioned response with higher activity in the conditioned chamber than the Nurr1 homozygous mice.

AH-40
Name, Major: Elaine Smith, Human Sciences/Apparel Textiles and Merchandising
Project Title: *The Wedding Dress from 1912*
Faculty Advisor Name: Lori Neuenfeldt and Charles Freeman, School of Human Sciences
Project Type: Poster
Project Category: Arts and Humanities

Abstract: The wedding dress can be used as a watermark for social norms as well as fashion styles from any era. An off-white, silk, beaded wedding gown was donated to the Mississippi State historic costume archive for extensive research to unveil the history behind this garment. What we know is it comes from the Pre-World War I Era, also known as the Titanic Era. This wedding gown from 1912 was crafted in a columnar silhouette, and reflects the soft feminine fashions of that time. Although the silhouette may be simple, the lace and beadwork are intricate. However, what we do not know is the designer of the garment. There are no apparent labels which would answer leading questions such as: the designer, where it was made, where it was purchased, the price, what the material is made of, and how to care for the garment. Therefore, the purpose of this case study is to research and discover when and where the garment was made and purchased, who designed it etc. Through the historic costume archive, there are many valuable resources at the university's disposal to answer the unknown history behind this wedding gown. To date, we hypothesize the garment to have been custom made to fit the bride. We think it is composed entirely of silk which would lead one to believe the garment to be more expensive than most wedding gowns in that era. The owner is believed to be in touch with the prominent styles and trends of that era as well as an affluent member of society. With further research, the history behind the owner and her wedding gown will continue to be unveiled.

BSE-54
Name, Major: Mary Ann Smith, Microbiology
Project Title: *Paracrine Induction of Macrophages by Melanoma Exosomes*
Faculty Advisor, Department: Joshua Hood, M.D., Ph.D., Pharmacology and Toxicology
Project Type: Poster
Project Category: Biological Sciences and Engineering

Abstract: Macrophages are vital to the innate immune response and can be divided into two general classes (M1 and M2) based on their function. M1 polarized macrophages promote inflammatory responses and mediate effective anti-tumor immune responses. M2 polarized macrophages modulate the inflammatory response, encourage tissue repair, and can promote tumor growth via suppression of anti-tumor immune responses. Our previous investigations demonstrated that melanoma exosomes prepare lymph nodes for tumor metastasis by creating a cancer friendly microenvironment. Other investigations have revealed that melanoma exosomes can suppress anti-tumor cytotoxic T cells and NK cells. They also induce myeloid derived suppressor cells (MDSCs). MDSCs can in turn induce pro-tumor M2 macrophages. However, to date, there have been no investigations into the direct influence of melanoma exosomes on macrophage polarity. In this study, we hypothesized that melanoma exosomes might influence the polarization of macrophages in the presence of macrophage polarizing factors such as LPS for M1 and IL-4 for M2. ELISA was used to measure TNF-α and IL-1β expression to test for M1 polarity and IL10 and TGF-β to test for M2 polarization. RT-RT PCR arrays were used to confirm and extend ELISA results by further assessing the expression of melanoma exosome induced M1 and M2 macrophage cytokine gene expression. Our data revealed that melanoma exosomes promoted a mixed phenotype macrophage response. These macrophages displayed hallmarks of both M1 and M2 immunity. The results demonstrate that melanoma exosomes can directly polarize macrophages toward a phenotype capable of facilitating pro-tumor supportive angiogenic and immunosuppressive functions. Ultimately, the role of melanoma exosomes in influencing macrophage pro-tumor immune function is unknown. These investigations provide a foundation for the development of novel therapeutics to take advantage of macrophage polarization via exosomes to better antagonize melanoma tumors.

BSE-55
Name, Major: Winston Smith, Physical Education/Kinesiology
Project Title: *Effects of Exergaming on Fine Motor Skills and Mental Health in Individuals with Intellectual Disabilities*
Faculty Advisor, Department: Chih-Chia (J.J.) Chen, Exercise Psychology
Project Type: Poster
Project Category: Biological Sciences and Engineering

Abstract: Objectives: Exercise has been shown to improve a variety of aspects of health in individuals with intellectual disabilities (ID). This pilot study was intended to investigate the impact of a single bout of exergaming on mood state and manual motor function in this population.
Methods: Five young adults were recruited in this study. It is a within participant design. Heart rate (HR), rating of perceived exertion (RPE), physical activity enjoyment scale (PAES), and Purdue Pegboard Assembly subtest (PPAS) were measured before and after a session of 10-min exergaming condition and control condition (i.e., sitting still), respectively. Paired t-test was computed for data analysis.
Key Findings: The results demonstrated that participants exerted more energy expenditure, measured as HRindex in the exergaming condition compared with control condition ($t(4) = 3.74$, $p = .02$). However, this difference was not reflective of subjective feeling of physical fatigue, measured as RPE ($t(4) = -1.43$, $p = .23$). Further, participants reported higher scores in PAES after exergaming condition than control condition ($t(4) = -3.00$, $p = .04$). It is assumed that the external motivators (e.g., music, social support) may elevate positive mood and distract participants' subjective feeling of physical fatigue. However, participants also exhibited a decrease in PPAS after exergaming condition than control condition ($t(4) = 3.63$, $p = .02$). It is possible that physical fatigue shown in the increase of HRindex cause mental demanding and lead to the interference in neuromuscular communication in PPAS.
Conclusion: It seems like that individuals with ID can perceive substantial benefits in mood state but not in manual motor performance after a single session of 10-min exergaming intervention. Alternative strategies should be considered in order to promote their neuromotor control. The findings are promising but needed to be replicated with large sample size and physiological measures to fully examine the effects of exergaming in this population.

PSE-17
Name, Major: Ryan Stallcup, Industrial Engineering
Project Title: *Wireless Network Jamming Using Directional Antennas*
Faculty Advisor, Department: Dr. Hugh Medal, Industrial and Systems Engineering
Project Type: Poster
Project Category: Physical Sciences and Engineering

Abstract: The optimization of a wireless network's throughput, or flow of data, is a common problem encountered in the field of operations research, but little work has been done in the past to optimize the throughput within a vulnerable wireless network that happens to use directional antennas. This type of problem, commonly known in the field of operations research as the wireless network jamming problem (WNJP), takes into consideration a wireless network composed of several antennas that are transmitting data among each other. In a perfect world, the network's antennas would be able to transmit data without any hindrances. However, the network considered in the WNJP is left somewhat defenseless against external interference, or jamming. This leads to the goal at hand, which is to optimize the amount of data passing through the network, in spite of any external interference. Up to the present day, all studies approaching this problem have transmitted data using omnidirectional antennas, which broadcast the same amount of signal in every direction. In the study at hand, the research team will instead be using directional antennas, which transmit a concentrated signal in only one direction. The signal strength and direction of each antenna is represented by its radiation pattern, and it is expected that through the employment of these radiation patterns, an optimization of the throughput will be attained. The main objective for the project is to model the network's antennas and data transmissions using a program called OPNET – a wireless network modeler produced by Riverbed Technologies. Data that is obtained from the optimization will be used to modify the attributes of the nodes created in the model, in order to simulate how the network will actually perform when directional antennas are utilized for the WNJP.0

AH-41
Name, Major: Searcy Swain, Human Sciences/Apparel Textiles and Merchandising
Project Title: *The Walking Suit*
Faculty Advisor Name: Charles Freeman and Lori Neuenfeldt, School of Human Sciences
Project Type: Poster
Project Category: Arts and Humanities

Abstract: Fashion during the early 1900s was true elegance. The women in this time period were often referred to as the "New Woman". These women could have been Suffragettes, workingwomen, and even well educated women. The New Woman was sporty, fashionably, and young. During this time women began participating in athletics, the walking suit allowed for more comfort and was not as formal as the normal dress that was expected from women in the past. This particular set is solid white, showing stains from previous wear. Because the designer is unknown, it's challenging to know exactly when it was made, who would wear this garment, and what type of lifestyle they would have. Therefore the purpose of this case study is to pinpoint what class and region it originates from. Researching women's dress of the 1900s will reveal more about this garment. I hoping my research will reveal more information about what type of woman would have worn this garment and why.

BSE-56
Name, Major: Sabrina Swistek, Biochemistry
Project Title: *Evaluation of Magnetic Nanoparticle Exposure on Boar Sperm Motility and Viability*
Faculty Advisor, Department: Dr. Jean Feugang, Animal and Dairy Science
Project Type: Poster
Project Category: Biological Sciences and Engineering

Abstract: Semen ejaculates contain a mixture of viable and non-viable spermatozoa, which imbalance influences male fertility. However, current techniques for detection of non-viable spermatozoa lack specific targeting for their removal. Previously, we used specifically designed magnetic nanoparticles to selectively target and remove non-viable spermatozoa from insemination doses (nanopurification). The present study assess the impacts of the nanopurification process on the viability of residual spermatozoa.
Insemination doses (n=5) were obtained at a local boar stud and semen were mixed with or without magnetic nanoparticles designed to target moribund (apoptotic and acrosome reacted) spermatozoa. Control and mixed semen were incubated, allowing sperm-nanoparticle interactions. Afterwards, mixed semen were placed against a powerful magnet trapping moribund spermatozoa and allowing elution of viable spermatozoa. Before and after incubations, sperm motion and viability parameters were respectively analyzed with a Computer-Assisted-Sperm-Analyzer (CASA) and flow cytometry after specific staining. Data (mean±sem) were analyzed with Statistical Analyzing Software (SAS). $P<0.05$ indicated threshold of significance.
There was a decreased proportion of static sperm after purification (8.95±0.46% vs. 11.28±0.49% for the control; $P<0.05$). In comparison to the control, the motion parameters (total and progressive motility, straightness, linearity, VSL, and BCF) were significantly increased in the purified group, while ALH was decreased ($P<0.05$). Viability parameters (plasma membrane integrity, acrosome and mitochondrial potential) were similar between control and nanopurified spermatozoa ($P>0.05$).
In conclusion, findings indicate the successful removal of damaged spermatozoa (static) through nanopurification without impairing viability of residual spermatozoa, but having beneficial effects on sperm motion. Work supported by USDA-ARS Biophotonics Initiative #58-6402-3-018.

PSE-18
Name, Major: Anna Taconi, Chemical Engineering
Project Title: *Exploring the Catalytic Activity of the Bimetallic Catalyst RuMoP for the Hydrodeoxygenation of Phenol for Biomass Conversion.*
Faculty Advisor, Department: Neeraj Rai, Chemical Engineering
Project Type: Poster
Project Category: Physical Sciences and Engineering

Abstract: Bimetallic catalysts are comprised of two different metals that are used promote selected chemical reactions. The cooperative interactions between the two metals result in higher stability, electron density, and bi-functionality when compared to their monometallic counterparts. Adding non-metallic elements, such as phosphorous, allows for charge distribution between the metal and nonmetal atoms, and effectively increases the Lewis acidity. The catalytic activities on bimetallic surfaces increase the performance of reactions like the hydrodeoxygenation of phenol, which is needed for biomass conversions. The study explores (001) and (112) surfaces of the bimetallic catalyst RuMoP as a potential catalyst for the hydrodeoxygenation of phenol, a common molecule found in biomass, to benzene. Surface and bulk energies were calculated using the exchange functional, optB88, for the miller index surfaces stated. Two adsorption positions are considered in the study, vertical adsorption and horizontal adsorption. Binding energies of phenol and benzene on the catalyst were calculated, again using the optB88 functional, to observe the more probable adsorption complex of phenol on the surface.

AH-42
Name, Major: Aimee' Taplin, Human Sciences/Apparel Textiles & Merchandising
Project Title: *The Little Blue Dress*
Faculty Advisor, Department: Charles Freeman and Lori Neuenfeldt, School of Human Sciences
Project Type: Poster
Project Category: Arts and Humanities

Abstract: Uncovering an old piece of clothing can be like uncovering a jewel in a treasure chest, it gives you an entrance into another time. The little blue dress is a piece of mystery because it's purpose is ambiguous. The fabric used is very light and transparent. The dominant color of the garment is a sky blue with purple polka dots covering it from top to bottom. This garment features a collar with cuffed short sleeves. The hexagon shaped buttons align down the center of the bodice with a pleated A-line skirt connected to it. The garment does have a worn label; it is barely legible. Although the garment is aged, the fabric still has durability. I am unsure of the purpose of this dress, and who it was worn by. Therefore, the purpose of this case study is to uncover the mystery behind the little blue dress. I will achieve this by conducting extensive research and answering questions. I hypothesize that this garment was created for a teenage girl as a casual dress in the 1930's or 1940's.

PSE-19
Name, Major: Katherine Alesa Taylor, Human Sciences/Food Nutrition and Dietetics
Project Title: *Trash to Treasure: Amaranth Reconsidered as a Source of Nutrition and Alternate Grain Product*
Faculty Advisor, Department: John Byrd, Plant and Soil Sciences
Project Type: Poster
Project Category: Physical Sciences and Engineering

Abstract: The USDA Plants Database (http://usda.plants.gov/) lists 48 species of amaranth, 11 of which occur in Mississippi. Palmer amaranth (Amaranthus palmerii) is reported from 30 states. It is also reported as the most troublesome weed of cotton in 7, peanut in 5, and soybean in 4 states within the Southern Weed Science Society region. Resistance to herbicides is one characteristic contributing to this ranking. Palmer amaranth could be a plant with the potential to become an important food source, rather than a detested weed. It has the potential to provide an important source of nutrients, and as a hardy plant, could be easily cultivated. Commercially produced Amaranthus grain has become more widely available in the U.S. The objective of this research was to compare the nutritional composition of glyphosate-resistant Palmer amaranth to commercially produced Amaranthus. Cultivated amaranth was acquired from a grocery store and glyphosate resistant amaranth was harvested from a field in Starkville, MS. Both were ground into a powder to fit through a 0.5 mm screen , and evaluated using standard scientific methods approved by Association of Official Analytical Chemists to determine the moisture, protein, lipid, ash, phenolic contents, and antioxidant capacity. The glyphosate-resistant amaranth contained significantly ($p < 0.05$) higher amount of lipid and ash but lower amount of protein than the commercially grown variety. Total phenolic content, total flavonoid content, DPPH-free radical scavenging property and oxygen radical absorbance capacity values in the glyphosate resistant amaranth were 77, 62, 499 and 157% higher than the values from commercial variety. These two varieties exhibited great differences not only in the contents but also in the types of individual phenolic acids present in free, extractable conjugated and bound forms. The glyphosate-resistant variety had 450% higher total free phenolic acids, and may be more beneficial for health. The present study offers new insight for the utilization of weeds.

AH-43
Name, Major: Monica Taylor, Human Sciences/Apparel Textiles and Merchandising
Project Title: *Historic Costume Collection: 19th Century Jacket*
Faculty Advisor, Department: Dr. Charles Freeman and Lori Neuenfeldt, School of Human Sciences
Project Type: Poster
Project Category: Arts and Humanities

Abstract: The woman's body has been clothed in a way to ensure that the boundary between feminine and masculine figures stayed intact and was never blurred. This continued to be true up until the end of the 19th century, which is the period of this piece. The jacket itself is part of Mississippi State University's Historic Costume Collection. What we know of this jacket is very little. We are aware of the general time period and that it was constructed from boiled wool and trimmed with silk and velvet. The entire garment is black in color and sports six, double breasted buttons of which three fasten. Presumably, this piece was created to be worn by a woman. However, what we do not know for certain is the specific year it was made during the late 1800s, or what it would have been worn for. Based on current research, I hypothesize that this wool jacket would have been possibly part of a riding habit or a suit of some sort and the style of the jacket itself inspired by menswear. Therefore, through this case study, we will discover the reason and ideas behind the creation of the jacket.

PSE-20
Name, Major: Gabrielle Tran, Civil Engineering
Project Title: *Catalpa Creek Stream Monitoring and Nutrient Analysis*
Faculty Advisor, Department: John J. Ramirez-Avila, PhD, Civil and Environmental Engineering
Project Type: Poster
Project Category: Physical Sciences and Engineering

Abstract: Catalpa Creek Stream Monitoring and Nutrient Analysis Mississippi State University's campus resides within the Red Bud-Catalpa Creek Watershed; this includes numerous research facilities for agriculture, environmental, animal, and dairy research. As such, much of this land use can contribute to the pollution of the Catalpa Creek, an impaired waterbody listed by the Mississippi Department of Environmental Quality (MDEQ). Water quality assessment and monitoring are essential steps for successful development of watershed management plans. Nutrient analysis is needed to measure concentrations of sediment and nutrients in waterbodies. The main objective of this study is to evaluate the temporal and spatial variation of flow and water quality conditions along the main channel and tributaries of the Catalpa Creek. Assessment of water quality and environmental conditions of Catalpa Creek will indicate the status and management conditions potentially needed to reduce impairment of the waterbody. The parameters evaluated in field include temperature, specific conductivity, pH, dissolved oxygen, flow depth, and velocity. Lab analysis included testing for total suspended solids (TSS), total phosphorus (TP), total kjeldahl nitrogen (TKN), and dissolved phosphorus (DP). A team of students gathered water samples and utilized a YSI Sonde and Sontek flow tracker to determine water quality parameters a 15 stations throughout the watershed. Preliminary results help to identify critical source areas for sediment and nutrients along the upper landscape and the main channel of the Catalpa Creek.

BSE-57
Name, Major: Dylan Tribolet, Biological Engineering
Project Title: *Vegetative Compatibility of Fungal Pathogen Cryphonectria parasitica in 11 Reforestation Sites Planted with Resistant American Chestnut Tree Hybrids in Southern Appalachian Mountains.*
Faculty Advisor, Department: Dr. Richard Baird, Biochemistry, Molecular Biology, Entomology, Plant Pathology
Project Type: Poster
Project Category: Biological Sciences and Engineering

Abstract: American chestnut (*Castanea dentata*) comprises over 31% of Great Smoky Mountain within the Southern Appalachian Mountains. Around 1940 this tree species was virtually eliminated from forest canopy due to an Asian introduced virulent (V) fungal pathogen *Cryphonectria parastica*. Only sprouts and sapling are present of American chestnut since the V pathogen only cuts off the vascular supply above the point of encircling cankers. However, in Europe the European chestnut was found to be overcoming the infections. A non-killing form of fungal pathogen called hypovirulent types (HV) which contained virus-like particles were being used in Italy to control the disease. The HV forms of the fungus were found to convert V forms by transmitting virus-like particles into the pathogenic or killer forms saving the trees. *Cryphonectria parasitica* can only transfer the virus to vegetative compatible hyphal cells which has two or more genetically-distinct with genetically (alleleic) compatible nuclei to allow hyphal fusion. In Europe, almost all V forms have an HV compatible group to convert it to HV. In the southeast region of North America, there has been reports of 40 or more groups, making 100% conversion impossible work with susceptible American chestnut. Hybrid planting began in 2009 with the introduction of resistant American chestnut x Chinese chestnut (*Castanea mollissima*) covering 11 sites in the Appalachian Mountains. Over 600 cankers have been sampled for V or HV forms of the pathogen. From all isolates, 130 were selected for genetic or vegetative compatibility testing. It is thought that with resistant or tolerant hybrids being planted in forests that HV could be used to support reintroduction, so the question becomes how many compatibility groups of V it would take for HV to convert them. Results from compatibility preliminary study found 42 types, all V forms with no indications that any HV occurred at the 11 locations.

BSE-58
Name, Major: Nisha Tripathi, Computer Science
Project Title: *An Integrated Pipeline to Compare Deferentially Expressed Genes and Functions*
Faculty Advisor, Department: Andy D. Perkins, Computer Science and Engineering
Project Type: Poster
Project Category: Biological Sciences and Engineering

Abstract: High throughput sequencing allows quantification of gene expression and subsequent comparison between groups, termed differential expression analysis. Using traditional methods, numerous samples are usually required. So, as to lessen the effects of any individual variation and provide the power to accurately determine differentially expressed transcripts, algorithms such as that of the f-divergence cutoff index (fCI) method have been proposed by other researchers for handling a small number of samples. Results from this and traditional methods have not been extensively compared to determine whether they identify similar sets of changed transcripts or associated functions. In the case presented here, five samples were available to study Summer Pasture Associated Recurrent Airway Obstruction (SPARAO) in horses. Gene expression was previously quantified by the Swiderski lab in both affected and non-affected horses during disease exacerbation (summer) and remission (winter). Differentially expressed transcripts were identified using both the fCI method and the more highly cited and more traditional edgeR method. Comparing the results from edgeR and fCI will allow us to identify whether the two methods uncovered similar transcripts, and any similarities or differences in the biological functions related to these transcripts. Functions of differentially expressed transcripts will be evaluated to determine whether one method identifies functions more closely associated with prior knowledge of the disease. A goal of this project is to develop a pipeline for automated differential expression analysis using high throughput sequence data with a variety of available methods.

BSE-59
Name, Department: Auriana Tucker, Biochemistry
Project Title: *Analyzing the rate of quantom dot uptake for anaxyrus fowleri and lithobates sevosus*
Faculty Advisor, Department: Carrie Vance, Biochemistry and Molecular Biology
Project Type: Poster
Project Category: Biological Sciences and Engineering

Abstract: The Mississippi Gopher frog (Lithobates sevosus; MGF) is currently critically endangered. Captive breeding programs aim to replenish diminishing populations by releasing offspring into the wild. Survivability information of offspring can be gathered by tracking released individuals, and though most tagging methods are harmful to the animals, a new tracking method using Quantum dots (Qdots) is being investigated. Qdots are fluorescent nanoparticles that can be incorporated into tadpoles and then viewed in live animals using in-vivo imaging technologies. Fowler toads (Anaxyrus fowleri) are used as a model species for the MGF to determine optimal uptake and retention of Qdots. This study investigated Qdot uptake by tadpoles from both A. fowleri and L. sevosus. A. fowleri tadpoles (age 3 days), were treated with 0nM and 2nM solutions of Qdots in distilled water and imaged with a Positron Emission Tomography-In Vivo Imaging System (PET-IVIS). The half-life of the Qdots was found to be 2.54 hours following administration. L. sevosus tadpoles aged 56 days were treated with 0nM and 2nM solutions of Qdots and imaged. Qdots were absorbed within 5 minutes, with a half-life of 1.05 minutes. The control wells showed no significant fluorescence in either case. For this study, each well contained 5 tadpoles for the A. fowleri tadpoles and 2 tadpoles per well for L. sevosus. L. sevosus tadpoles were found to have a shorter half-life than that of the A. fowleri. The total mass of two L. sevosus tadpoles is equivalent to the total mass of 5 younger A. fowleri tadpoles. The method of uptake for these amphibians is being determined and evidence suggests that the Qdots may aggregate in the intestines (Julien et al-unpublished).

PSE-21
Name, Major: Emily Turner, Civil Engineering
Project Title: *Using Biochar to Reduce Non Point Source Pollution*
Faculty Advisor, Department: John J. Ramirez-Avila**,** Civil and Environmental Engineering and Dr. Todd Mlsna, Chemistry
Project Type: Poster
Project Category: Physical Sciences and Engineering

Abstract: Stormwater runoff from impervious surfaces across Mississippi State University's (MSU's) campus are polluted with nutrients, hydrocarbons, and metals originating from various vegetative and built elements. The current hydrologic paradigm emphasizes water management at the source in order to prevent the compounding of downstream effects. By taking a watershed approach to small scale stormwater management on MSU's campus, pollutant load reductions can be made by employing a filter system at checkpoints along the watershed flow path that work to filter water as close to the source as possible. An innovative filter medium, biochar, is a subject of research among MSU Chemistry and Civil and Environmental Engineering faculty and has been found to be very effective at sediment and nutrient removal. Despite being successful under laboratory conditions, biochar has not been adequately studied under field conditions, where exists the ultimate impact on society. This project proposes the implementation of a small scale biochar filtration system within a small parking lot "watershed" on MSU's campus, incorporating both existing and proposed infrastructure elements to maximize the purification power of the biochar.

PSE-22
Name, Major: Flannery Voges-Haupt, Chemistry
Project Title: *Fold Upon Binding – A tale of copper(II) binding to the N-terminal region of human carbonic anhydrase II*
Faculty Advisor, Department: Dr. Joseph Emerson, Chemistry
Project Type: Poster
Project Category: Physical Sciences and Engineering

Abstract: Carbonic anhydrases (CA) are frequently studied metalloenzymes, which seem to be imperative for life. A member of this family of CA found in human erythrocytes, is carbonic anhydrase II. Human carbonic anhydrase II (hCAII) is formally a zinc-metalloenzyme, but can be reconstituted with several transition metal ions. Here we report our most recent results studying the thermodynamics of copper(II) binding to a novel, high affinity copper(II) binding site in the unstructured N-terminal region of hCAII, as a means to determine how copper(II) binding impacts the conformational entropy and globular structure of hCAII.

AH-44
Nam, Major: Francesca Wadlington, Foreign Languages/Spanish
Project Title: *Geminate Consonants in Italian: English Speakers' Perception Before and After Training*
Faculty Advisor, Department: Wendy Herd, Linguistics and TESOL
Project Type: Poster
Project Category: Arts and Humanities
Other Categories: TRC

Abstract: This study investigated the effects of computer-assisted training on native English speakers' perception of geminate consonants within Italian words. Ten native speakers of English with at least a one year background in Italian (n=3), Spanish (n=5), or Latin (n=2) participated in Test 1 (identification task before training) and Test 2 (identification task after training). Of those ten participants, only one group of five received training between tests. Test 1 included 15 minimal pairs of Italian words that only differ in singleton vs. geminate consonants (e.g., fato 'fate' vs. fatto 'fact'). Participants who received training independently used an interactive PowerPoint to practice the Test 1 stimuli once a day for one week; controls received no training during this time. Test 2 included the stimuli from Test 1 plus an additional set of 15 novel minimal pairs. Participants correctly identified 66.5% of the items at Test 1, with little difference between the two groups. Critically, after training, the trained group improved from 64% on Test 1 to 80% on Test 2 whereas the control group identified 69% correctly on both Tests. These findings suggest that short-term computer-assisted training aides in the acquisition of Italian geminate consonants and that lab-based high variability perception training can be modified for use by classroom teachers.

AH-45
Name, Major: Abbey Wallace, Landscape Architecture
Project Title: *No Love for Nonconnah, Discovering the Source of Stormwater Concerns*
Faculty Advisor, Department: Peter Summerlin, Landscape Architecture
Project Type: Poster
Project Category: Arts and Humanities

Abstract: With increased commercial and industrial development in our metropolitan areas, major streams and waterbodies are under extreme stress. Current development strategies increase impervious surfaces, areas that do not allow stormwater to infiltrate, threatening the health and wellness of the environment and citizens in growing urban areas. Developed areas such as large retail parking lots channel storm water into oversized pipes and push excessive amounts of unfiltered water into streams at a high rate, contributing to flashfloods, erosion and polluted waterways. This analysis and planning project sought to address these concerns by strategically targeting threatened areas along the Nonconnah Creek watershed, a major tributary to the Mississippi River and a major watershed surrounding the Memphis Metropolitan area in a dense industrial area. A collection of relevant data was compiled and a GIS model developed to assess the current conditions and identify strategic areas to invest public funding in an effort to repair the highly threatened Nonconnah Creek. The second part to the project analyzed the four threatened areas within the Nonconnah Creek watershed but selected just one particular site within the industrial corridor to further demonstrate how those efforts could begin to redefine the current paradigm of industrial development in this threatened area and areas alike. Within the selected industrial target area watershed, a regional facility was proposed on a vacant lot along a tributary, Tenmile Creek, of the Nonconnah Creek to slow down and manage the stormwater before reentering the creek. Overall, the project highlighted major areas of stormwater concerns in the industrial corridor of Memphis, TN with intentions of creating a precedent for similar development or redevelopment projects.

BSE-60
Name, Major: Hunter Walt, Biochemistry
Project Title: *Comparative study of creatinine and specific gravity for the normalization of anuran urine*
Faculty Advisor, Department: Carrie Vance, Biochemistry and Molecular Biology
Project Type: Poster
Project Category: Biological Sciences and Engineering

Abstract: Urine is used to assess endocrine related physiology in reproduction and stress in amphibians. However, inter- and intra- endocrine assay standardization requires normalization based on urine dilution. The chemical analysis of creatinine (from muscle metabolism), quantitatively measures urine concentration. Although urine is easy to obtain from anurans non-invasively, low volume yields (<500 µl) make the destructive creatinine assay impractical. Osmolality or specific gravity are alternative assays that have been validated for measuring mammalian urine concentration and cause little or no sample destruction. This study's objectives were to determine if specific gravity (density to water ratio) could be measured using a refractometer and validated against the traditional creatinine assay for determination of anuran urine concentration for endocrine assay applications. Urine samples (n=20 per species) were collected from Mississippi gopher frogs (Lithobates sevosus; MGF) and fowler's toads (Anaxyrus fowleri; FT), and stored at -80°C. Samples were centrifuged and vortexed before specific gravity was measured using an ATAGO digital hand-held pocket refractometer (PAL-10S). Replicates (n=3/sample) consisted of 100µl of undiluted urine. Validation of the specific gravity measurements was conducted against creatinine assays with urine samples diluted 1:2 (MGF) and 1:4 (FT). Creatinine assays required 50 µl per well each of sample, water, 0.04M picric acid, and 0.75N NaOH and were read at 490nm. Specific gravity values ranged from 1.002–1.006 in the MGF, and similarly in the FT (1.002–1.007). MGF creatinine concentrations ranged from 0.1161 to 2.5400 mg/dL and 0.4132 to 9.9565 mg/dL in the FT. Linear regression analysis provided no evidence to support a correlation between creatinine and specific gravity in the MGF (y=0.0015x+1.0032, R2=0.1201) or FT (y=0.0014x+1.004, R2=0.3091). Findings indicate the ATAGO PAL-10S refractometer does not have the accuracy to measure specific gravity in anuran urine. Future studies include testing osmolarity and a refractometer with higher specificity and sensitivity.

SS-36
Name, Major: Taylor Watson, Human Sciences/Human Development and Family Studies
Project Title: *The Effect of Equine Assisted Activities on the Social Functioning in Children with Developmental Disabilities*
Faculty Advisor, Department: Julie C. Parker, School of Human Sciences - Human Development and Family Studies
Project Type: Poster
Project Category: Social Sciences
Other Categories: Community Engagement

Abstract: Many young children with developmental disability are characterized by impairments in social function skills (communication, interaction, and behavioral control). Equine Assisted Activity (EAA) and Therapy programs are considered a complementary and alternative medicine (CAM) treatment program facilitated to address the physical and social needs of children with developmental disability. To date there have been limited studies that focus on the impact of equine assisted activities (EAA) for social functioning in young children with disabilities. EAA have been used to treat individuals with physical and intellectual disabilities and may have a positive impact on negative behaviors by promoting sensory regulation, self-efficacy, and communication skills for the participant (Bass et al., 2009; Cuypers et. al., 2011; David, 2007). EAA is thought to be beneficial because it incorporates human-animal interaction, cognitive-behavioral-based stress management, and physiological relaxation techniques into the programing. The purpose of this research was to explore the effects of EAA on social functioning and sleep hygiene for a child with developmental disability. The subject of this case study presented with Autism Spectrum Disorder (ASD) and had never participated in an EAA program prior to the study. This case study utilized multiple methods to gain an in-depth perspective on the benefits of participation in equine assisted activities and therapeutic riding. Three forms of data were collected including a sleep diary, the Sensory Profile, and qualitative process notes. Results from this study were mixed but showed that there is a need for further research using both qualitative and quantitative measures.

BSE-61
Name, Major: William Webb, Forestry/Forest Management
Project Title: *Species-specific leaf litter interception*
Faculty Advisor, Department: Heather D. Alexander, Forestry
Project Type: Poster
Project Category: Biological Sciences and Engineering

Abstract: Over the past few decades in the eastern U.S., traditionally oak-dominated upland forests have experienced a shift towards increased recruitment of shade-tolerant, fire-sensitive species. It is theorized that this shift could create a positive feedback loop by promoting fire-resistant conditions (mesophication), such as cool, moist understory, which would likely favor the regeneration of shade tolerant, fire sensitive species (i.e., mesophytes) while conversely deterring the proliferation of upland oaks. In this experiment, we intend to determine if there is a quantitative precedent for the idea of mesophication by focusing on whether leaf litter will differ in the amount of moisture it holds by species. To address this issue, air-dried leaf litter from four hypothesized mesophytes (*Acer rubrum, A. saccharum, Carya spp., Fagus grandifolia*) and three upland oaks (*Quercus alba, Q. coccinea, Q. montana*) will be used to calculate specific leaf area by calculating leaf area and dry weight and then dividing the former by the latter. Then we will measure the amount of water intercepted by each leaf species by weighing leaves before and after entering a rain simulator. The specific leaf area and interception values will then be paired to determine the amount of water intercepted by each leaf species per unit of specific leaf area in order to illustrate possible changes to forest bed flammability as a result of largescale changes in species distribution. We hypothesize that mesophyte species will retain more water than upland oak species, which combined with an increased recruitment of mesophytes in eastern U.S. forests would suggest increased mesophytes lead to cooler, less flammable conditions.

PSE-23
Name, Major: Adam Weed, Mechanical Engineering
Project Title: *Fuel and Combustion Research Laboratory Ignition System*
Faculty Advisor, Department: Omid Askari, Mechanical Engineering
Project Type: Poster
Project Category: Physical Sciences and Engineering

Abstract: Fundamental studies are key to understanding the science of fuel and combustion. In order to diversify and further Mississippi State University's research endeavors, a team of mechanical engineers have set out to design Mississippi State's first fuel and combustion research laboratory. This research laboratory will be equipped with the basic equipment to study the fundamentals of fuel and combustion. In order to have a functioning combustion laboratory, a detailed ignition system must be design to adequately ignite any desired fuel at a vast range of temperatures, pressures, and air/fuel ratios. There is no substitute for having a solid understanding of the basics of combustion and ignition when designing a complex ignition system. Key concepts such as break down voltage, minimum ignition energy, AC and DC voltages, transformer function, and how different semiconductors operate form the basis for understanding the fuel and combustion laboratory's requirements. In order to determine the necessary system requirements, published research articles were analyzed from several universities' such as Northeastern University, Massachusetts Institute of Technology, and California Institute of Technology. Behaviors of different fuel mixtures at varying temperatures and pressures were also researched to determine the range of each ignition system characteristics. From this research, it was found that an ignition system suitable for application in a fuel and combustion laboratory would need to be able to supply a DC voltage between 1,200 and 4,000 volts to overcome the break down voltages of different air fuel mixtures. Additionally, it would need to be able to supply a minimum of 1 Joule of energy to overcome the minimum ignition energy of the fuel mixtures. In summary, the completed fuel and combustion laboratory will have a robust, safe, and reliable way to adequately ignite any mixture composition that will be required for current and future research endeavors.

BSE-62
Name, Major: Bradley Welch, Biochemistry
Project Title: *Hydrogel Derived from Decellurized Prcine Aorta*
Faculty Advisor, Department: Lakiesha Williams, Agricultural and Biological Engineering
Project Type: Poster
Project Category: Biological Sciences and Engineering

Abstract: According to the American Heart Association, cardiovascular disease is the leading global cause of death, accounting for 17.3 million death per years. This number is expected to grow to more than 23.6 million by 2030. Cardiovascular diseases claim more lives than all forms of cancer combine, and in the United States, cardiovascular diseases claim one life every 40 seconds. Many patients who suffer from a myocardial infarction will never fully cover from the damage that occurs during the attack and will later need a heart transplant. Each year, 3,500 to 4,000 people wait for heart transplants, even though there are more than 2,000 heart transplant surgeries performed annually. Many patients remain on a waiting list for months to receive a heart transplant, and 25% of patients will die while awaiting a heart transplant. Our research goal was to develop a hydrogel that could be used in surgery for treatment of myocardial infarction and to promote cardiac regeneration. If successful, this hydrogel would promote cardiac recovery and regeneration due to myocardial infarction and, thus, substantially decrease the need for heart transplants later in life.
In our study, we were able to remove all cellular contents from dissected porcine aorta using a previously discovered intact tissue decellularization procedure. The decellularized samples were then subjected to a phosphate buffered saline (PBS) wash. After thorough decellularizing and washing, the tissue samples were lyophilized and milled into an extracellular matrix (ECM) powder. In this study, we hypothesized that, if our porcine aortic ECM powder was subjected to previous non-aortic ECM hydrogel synthesis methods, our porcine aortic ECM powder would be converted into a hydrogel. However, the porcine aorta seems to possess significant biochemical differences from other previously converted ECM powders. However, we were successfully able (1) to obtain an acellular porcine aorta, (2) to lyophilize and mill an ECM powder with a low lipid presence, (3) and to successfully create a porcine aortic hydrogel using the ECM powder. The knowledge of heart ECM and of the biochemical properties of cardiac tissue is essential for understanding cardiac tissue engineering and regeneration. Our research plan includes future rheology, electron microscopy, mechanical testing, cell infiltration measuring, and an in vivo study.

SS-37
Name, Major: Haley Wheeler, Human Sciences/Food Nutrition and Dietetics
Project Title: *Availability and Affordability of Yogurt in Supplemental Nutrition Assistance Program Authorized Convenience Stores in Mississippi*
Faculty Advisor, Department: Sylvia H. Byrd, Food Science, Nutrition, and Health Promotion
Project Type: Poster
Project Category: Social Sciences
Other Categories: Public Health

Abstract: High prevalence of food insecurity and food deserts in Mississippi contribute to obesity. In Mississippi, 36% of adults were obese in 2015, 22% are in poverty, and 22% participate in the Supplemental Nutrition Assistance Program (SNAP), a federal program providing monetary benefits to spend on food. SNAP helps make nutritious food more affordable but not more available. In low-income areas there are food deserts: there are more convenience stores (CS) and fewer supermarkets; SNAP benefits are redeemed more frequently at CS even if a supermarket is present. The most commonly purchased items at CS are sugar-sweetened beverages, chips, prepared foods, candy, and pastries. Availability of CS correlates positively with higher body mass index (BMI); one way to ameliorate obesity is to increase the availability of healthy foods in CS. Yogurt is a nutrient dense food with health benefits and long shelf life. If available in CS, yogurt could be a healthy snack alternative to chips and soda. This study examines the availability and affordability of yogurt in SNAP authorized CS in Mississippi.
The USDA lists 3585 stores in Mississippi that meet the inclusion criteria; 405 were sampled. Approximately the same proportion of stores per county were surveyed. A modified Nutrition Environment Measures Survey (NEMS) was used to collect data. Stores were categorized by number of cash registers into: CS (n=212), grocery stores (n=154), and supermarkets (n=39).
Approximately 16% (n=36) of CS, 57% (n=91) of grocery stores, and 89% (n=36) of supermarkets carry any form of yogurt. The average price of an individually sold, single-serving size (≤6oz) container of yogurt in a CS is $0.97.
While yogurt is a relatively affordable snack, it is not readily available in SNAP authorized CS in Mississippi. Policy efforts should be made to promote health by increasing the availability of yogurt and other healthy foods.

BSE-63
Name, Major: Callie Whitfield, Biochemistry
Project Title: *Illumina Maize Genome Sequencing Data Analysis for Identification of Fungal Resistance in Maize*
Faculty Advisor, Department: Xueyan Shan, Biochemistry and Molecular Biology
Project Type: Poster
Project Category: Biological Sciences and Engineering

Abstract: Zea mays production is very agriculturally and economically important in many parts of the world. The United States alone produces more maize products than any other item for consumption. Special interest in research is given to this crop for these reasons. Aspergillus flavus is a naturally occurring fungus that produces aflatoxins in maize plants. Aflatoxin accumulation is harmful to humans, leading to acute hepatitis, immunosuppression, carcinoma, as well as neutropenia. Aside from medical consequences, maize farmers take enormous losses each year due to post harvest aflatoxin accumulation. The most efficient solution to this problem is to develop a maize line that has sufficient agronomical qualities as well as resistance to the fungal infection. With the recent advances in genome sequencing, this goal is becoming more easily attainable. The genomes of three maize lines have been obtained through Illumina DNA sequencing data. Using this data, comparisons can be made between the resistance and susceptible lines in order to search for DNA markers that signal fungal resistance. This project includes extracting DNA directly from four maize lines, two of which are resistant to the fungus (Mp313E and Mp715) and two of which are susceptible to the fungus (Va35 and B73). The project also includes designing PCR primers and analyzing the results using 1.5% agarose gel electrophoresis.

SS-38
Name, Major: Emily Willers, Human Sciences/Human Development and Family Studies
Project Title: *Effect of sporting event attendance on licensed apparel purchase behavior*
Faculty Advisor, Department: Dr. Joe Wilmoth and Dr. Charles Freeman, School of Human Sciences
Project Type: Poster
Project Category: Social Sciences

Abstract: Mississippi State students have the opportunity to attend several school-sponsored sporting events each year. College culture encourages these students to purchase and wear specific clothing to these events, such as licensed apparel in school colors. An ample amount of research exists on the specific topic of licensed apparel, with investigations of brand influence, role models, group identification, and more. However, knowledge is lacking on the relationship between sporting event attendance and licensed apparel purchase intention. The purpose of this study is to identify a correlation between the number of Mississippi State sporting events a student attends and the amount of school-licensed apparel purchased. The variables being explored in the study include the number of events attended and the number of Mississippi State clothing items owned. We hypothesize that there will be a positive relationship between the number of sporting events a student attends and the number of licensed clothing items they own. In order to obtain this data, an online survey will be administered to undergraduate students at Mississippi State University.

BSE-64
Name, Major: Douglas Williams, Biochemistry
Project Title: *Interactions Between Glycoprotein E and bICP0 in Late Stage Infection of Bovine Herpesvirus1*
Faculty Advisor, Department: Florencia Meyer, Biochemistry and Molecular Biology
Project Type: Poster
Project Category: Biological Sciences and Engineering

Abstract: Glycoprotein E is a viral glycoprotein which is found in the membrane of Bovine Herpesvirus1 (BHV1). Glycoprotein E functions to promote entry of BHV1 into a host cell, and promotes the spread of BHV1. We have hypothesized that during the late stages of viral infection by BHV1, glycoprotein E is interacting with another viral protein called infected-cell protein 0, or bICP0. These interactions were investigated using immunoprecipitation and western blotting. In order to determine the point at which glycoprotein E is most expressed, a western blot was carried out using infected cells collected at 8, 12, 16, and 24 hours post infection, respectively. Autoradiographic analysis revealed a distinct increase in the expression of glycoprotein E as infection time increased, with the most significant expression at 24 hours post infection. An immunoprecipitation of glycoprotein E was carried out successfully on infected and mock cell lysates to confirm that the antibody used to precipitate glycoprotein E was working properly. The same cell lysate samples were subjected to SDS-PAGE and the western blot was probed for the binding partner of glycoprotein E, bICP0. In future experiments, we would like to examine these proteins using microscopy to visualize where these proteins are located during infection and where in the cell they are interacting.

SS-39
Name, Major: Emily Williamson, Psychology
Project Title: *The Effect of Physical Limitations on Cognitive Performance and Mental Health in Older Adults*
Faculty Advisor, Department: Danielle Nadorff, Psychology
Project Type: Poster
Project Category: Social Sciences

Abstract: The aging process often brings on problems with the everyday tasks required in order to live independently. In addition to a loss of independence, older adults also tend to experience increased depressive symptoms, as well as a decrease in cognitive performance. This study investigates the connection between physical limitations and both cognitive performance and mental health levels in adults aged 50 and over. Data were taken from the Swedish Adoption/Twin Study on Aging (SATSA). Cognitive performance was measured using performance levels on the digit span test (both forward and backward), while results from the Center for Epidemiologic Studies Depression Scale (CES-D) were used to measure depressive symptoms. Activities of daily living were significantly correlated with both cognitive performance and depressive symptoms. Additionally, there were significant group differences in these areas for those who reported physical limitations on a daily basis, versus those who did not. Our findings are relevant to a number of groups, including custodial grandparents (grandparents who have the primary responsibility for raising their grandchildren), who experience higher levels of stress and depression than their same-aged peers, and experience many physical demands related to childcare duties

AH-46
Name, Major: Laine Wilson, Human Sciences/Apparel Textiles and Merchandising
Project Title: *1960s Wedding Gown*
Faculty Advisor, Department: Charles Freeman and Lori Neuenfeldt, School of Human Sciences
Project Type: Poster
Project Category: Arts and Humanities

Abstract: Fashion is constantly changing and evolving and this is especially true with wedding gowns. Wedding gowns, because they are preserved and appreciated by their owners and hardly ever worn more than once, makes them more likely to be offered as museum donations. Mary Emma Wakefield, a second grade teacher, at some point in the 1960s, wore this classic wedding gown. This classic wedding dress contains many of the features of the typical 60s wedding dress; such as the mod, straight silhouette and the boat neckline. One of the only things on the dress that has a label is the zipper, which was produced by Conmatic. This zipper was introduced in 1954 and its end of use was in the mid 60s. However, what we do not know is where there garment was made, by whom, where it was worn, and the fabrication. Therefore, the purpose of the case study is to aid us in finding this information to conclude the file on this dress. We will find this information through the Historic Costume files, where many valuable resources are available at our disposal to aid in our research. We hypothesized that since the zipper that was used is normally for men's military jackets and because the seams are not finished, that the dress could have been homemade or custom made. Through more extensive research I hope to find more information on the style of the dress and who made it.

SS-40
Name, Major: Courtney Windhorn, Sociology
Project Title: *Mississippi School Choice Research Project*
Faculty Advisor, Department: Margaret Hagerman, Sociology
Project Type: Poster
Project Category: Social Sciences

Abstract: In response to the national desegregation of public schools in the United States starting in 1954, white communities across the South quickly constructed segregationist academies. Segregationist academies are schools that opened with the explicit intent to provide a privatized, exclusively-white school environment. These schools gave white parents and school officials freedom to discriminate against people of color and to choose a curriculum that reflected the authoritarian style discipline and prejudiced ideals that they valued. These academies are not just a thing of the past, however, as they are still thriving in the United States, especially the South. The purpose of this study is to explore how white parents with children currently enrolled in one particular segregationist academy understand the racial history of their child's school. In addition, this research has a focus on the ways in which these parents discuss racial issues with their children and if/how they want them to understand these issues. Interviews were conducted with 20 parents with children currently enrolled in one of these academy schools in a small town in Mississippi. Preliminary findings suggest that though many of the parents interviewed were aware that this school was founded because of white flight during desegregation and that the over 90% of the current student body is white, most of them deny that race is a salient factor for parents with children enrolled in the school today. Some parents stated that they did not discuss this with their children at all, while others claimed that their children are colorblind and, as one parent said, "…just don't really view it as that big a deal." The majority of parents interviewed do not feel that racism is an issue today, and those that do, deny that it is an issue directly affecting their town, school choice decisions, or children.

AH-47
Name, Major: Christian Wolf, Human Sciences/Apparel Textiles and Merchandising
Project Title: *1960's Loungewear Investigation*
Faculty Advisor, Department: Charles Freeman, Lori Neuenfeldt, Apparel Textiles and Merchandising
Project Type: Poster
Project Category: Arts and Humanities
Other Categories: Public Health

Abstract: Loungewear is a basic essential in a woman's wardrobe, for comfortability and for sleep. Shadowline created light-weighted and simple loungewear for women in 1968, although it is unknown whether they still exist today. This piece may be one of many produced at the time, however, it holds a place in history as fitting puzzle piece to the timeline of 20th century loungewear. It is completely composed of nylon, with floral lacing and floral embroideries along the neck and shoulder area. This garment is an off-white color, with green and pink pops of color coming from the floral embroideries. While the era and manufacturer of this piece has been discovered, it is still unknown as to who owned this piece and the journey it's been through. How does this garment compare to other clothing, in terms of style and materials, from that era? Where specifically has this garment been created, and what significance does this manufacturer hold in the timeline of breakthroughs in fashion production? The purpose of this case study is to answer these questions, and discover many more missing pieces in the timeline of this garment's existence. These questions can be answered and these discoveries can be made through careful examination of this garment and similar garments from the 1960's era, and comparing it to today's standards and the standards held beforehand.

BSE-65
Name, Major: Katherine Wood, Physical Education/Kinesiology
Project Title: *Impact of tennis participation on parameters of health*
Faculty Advisor, Department: Megan E. Holmes, Kinesiology
Project Type: Poster
Project Category: Biological Sciences and Engineering
Other Categories: Public Health

Abstract: BACKGROUND: Literature suggests that tennis participation may benefit physical and psychological health. Specifically, tennis participation has been linked with a decrease in CVD risk, a decrease in anxiety, as well as depression. PURPOSE: This study examined the relationship between participating in tennis on various parameters of health. METHODS: A link to an online questionnaire consisting of 114 questions was sent to members of the International Tennis Federation (ITF). The questionnaire consisted of questions from IPAQ, BRFSS, Connor-Davidson Resilience Scale, Satisfaction with Life Survey, as well as specific tennis participation questions. BMI was determined by subjects' self-reported height and weight. Descriptive characteristics were calculated for all variables and a chi-squared goodness-of-fit test was used to examine the relationships between health variables of our sample and results from BRFSS. RESULTS: When compared to BRFSS the study sample exhibited several significant differences. Specifically, with the following three categories: Adults with good or better health (χ^2=591.9, p=0.0001), Adults who were greater than or equal to 45 years old who have had coronary heart disease (χ^2= 6.065, p=0.014), and Adults who were 18 years and older and who were obese (χ^2=20.8, p=0.0001).When the study sample was compared to BRFSS, there was no significant difference found when looking at adults having had a depressive disorder (χ^2=0.979, p=0.322). DISCUSSION: This study highlights involvement in activities that participation can continue throughout the lifespan could result in improved health, however, more research is warranted which examines those who play tennis compared to other populations, including those who are not physically active.

BSE-66
Name, Major: Emily Wright, Biological Engineering
Project Title: *Biochar Water Filter for Nutrient Removal*
Faculty Advisor, Department: Joel Paz, Agricultural and Biological Engineering
Project Type: Poster
Project Category: Biological Sciences and Engineering

Abstract: Urban storm water runoff is surface runoff of rainwater created by urbanization. Waterways and receiving bodies of water near urban areas can be adversely affected by this type of runoff. According to the EPA, urban storm water runoff "affects water quality, water quantity, habitat and biological resources, public health, and the aesthetic appearance of urban waterways." This runoff can carry nutrients like nitrogen and phosphorus that have multiple negative impacts. These pollutants and others often exceed the federal maximum contaminant levels. The use of a filtration device is an area of research into remedying this problem because of its potential to remove these harmful contaminants. The specific objective of this research is to investigate the use of biochar as a potential filter media to remove the contaminates in urban storm water runoff. The pyrolysis process that results in biochar gives the material a very high surface area, low density, superb adsorptive properties, and a microporous structure. Biochar is expected to perform well as a filter media because of these properties. Research aims of this project include which biochar type would be most capable in removing pollutants, the outer filter material, the ideal shape of the filter, and successfully allowing water flow to avoid back-up and flooding problems while at the same time, removing the necessary pollutants.

BSE-67
Name, Major: Kalisha Yankey, Animal and Dairy Sciences
Project Title: *Effect of body condition score on steroid metabolizing enzymes in various horse tissues*
Faculty Advisor, Department: Caleb Lemley, Animal and Dairy Sciences
Project Type: Poster
Project Category: Biological Sciences and Engineering

Abstract: Alterations in body condition scores (BCS) have been shown to have a direct effect on reproductive efficiency in mammalian species. Our objectives were to determine the activity of steroid metabolizing enzymes in horses with varying BCS. Based on previous data in other livestock species, we hypothesized a concomitant increase in BCS and steroid metabolizing enzymes. The BCS of twenty non-pregnant, anestrous mares were recorded prior to euthanasia. Tissue samples were collected from the liver, kidney, adrenal gland, ovary, and endometrium. Cytochrome P450 1A (CYP1A), 2C (CYP2C), 3A (CYP3A), and uridine 5'-diphospho-glucuronosyltransferase (UGT) activities were determined using luminogenic substrates. The MIXED procedure of SAS (SAS Inst. Inc., Cary, NC) was used to test the effect of BCS within a given tissue. Age and BW were used as covariates and statistical significance declared at $P < 0.05$. Enzyme activity was not different across the varying BCS except in the adrenal tissues ($P < 0.03$), where CYP1A activity was increased in BCS 5 versus BCS 4 and 6 which were similar. Activity of CYP1A was 100-fold greater ($P < 0.0001$) in the liver compared with the adrenal, ovary, and kidney, while activity of CYP1A was undetectable in the endometrium. Activity of CYP2C was 100-fold greater ($P < 0.0001$) in the liver compared with the adrenal, ovary, and endometrium, while activity of CYP2C was undetectable in the kidney. Activity of CYP3A was only detected in the liver. Activity of UGT was 3-fold greater ($P < 0.0001$) in liver versus kidney, while activity of UGT was 9-fold greater ($P < 0.0001$) in the kidney versus the ovary and endometrium. In general, BCS did not alter the activity of steroid metabolizing enzymes in horses. However, the tissue differences of these enzymes could be indicative of variation in equine hormone metabolism compared to other livestock species

AH-48
Name, Major: Skylar Zeigler, Human Sciences/Apparel Textiles and Merchandising
Project Title: *The Leisure Suit*
Faculty Advisor, Department: Charles Freeman and Lori Neuenfeldt, School of Human Sciences
Project Type: Poster
Project Category: Arts and Humanities

Abstract: Concerned mothers always ask "if your friends jumped off a bridge, would you?" Style conscious mothers would ask if your friends wore the leisure suit, would you? The men's polyester suit was a fad created in the 1970s by Jerry Rosengarten. By the end of the 1970s the leisure suit lost its popularity and fell under the name "sleazure suit". The leisure suit in our historical costume collection is in excellent condition and was donated from June Green. The garments textile is polyester and the fabrication method is double-knit. This piece features a bold pattern, exaggerated collar, and a slight bell bottom slant. The jacket is very shirt-like with heavy top-stitching. The leisure suit was often worn with a bright color shirt or a shirt with a gaudy pattern. However, what we don't know is the area of use and who it was used by. Therefore, the purpose of this case study is to identify who leisure suits were worn by and to locate other similar garments that can help aid in this process. I hypothesize that this piece was worn for everyday wear because of its comfortability. Most of the research that has been done on our historical costume collection has been geared towards women's wear. Venturing out and selecting a men's garment will allow me to locate similar styles that were worn by men in the 1970's. The main emphasis of leisure suits were their comfortability and relaxed style.

BSE-68
Name, Major: Katie Zornow, Animal and Dairy Sciences
Project Title: *Binding of antibiotics in raw milk using activated carbon*
Faculty Advisor, Department: Darrell Sparks**,** Biochemistry, Molecular Biology, Entomology, Plant Pathology
Project Type: Poster
Project Category: Biological Sciences and Engineering

Abstract: Antibiotics are an essential component in the management of bovine dairy herd health. While ensuring the health and safety of any animals treated with antibiotic drugs is of utmost importance, the potential negative economic impacts that dairy producers incur must also be taken into consideration. Lactating animals that are undergoing antibiotic treatment can result in short-term financial costs to producers; moreover,strict withdrawal periods are federally mandated for these animals in order to prevent secretion of antibiotics or antibiotic metabolites from tainting milk that goes into public consumption. Any antibiotic-contaminated milk is discarded at the expense of the producer. This research aims to combat this financial burden, while still providing for public health and safety, by establishing activated carbon as a binding agent to remove antibiotics from raw milk. All raw milk used in this research is obtained from the dairy cattle herds at Mississippi State University's Joe Bearden Dairy Research Center. The milk will be analyzed for the presence of antibiotics using a High Performance Liquid Chromatography Mass Spectrometer (HPLC-MS) prior to being used as a control for the binding study. In order to test the binding properties of activated carbon, raw milk samples will be spiked with various concentrations and classes of antibiotics and then analyzed by HPLC-MS.

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