

2019 Susan A. Siltanen
Graduate Research Symposium

April 11, 2019 | 9 a.m. - Noon
Thad Cochran Center

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USM Graduate School Senate



Oral Presentations

Arts and Humanities

Majedah Alsewalah

Academic School: Communication

Majoring in Mass Communication

Presentation: 'Twitter and Cultural Bias Towards Immigrants in Politicians Tweets During the US Presidential Election of 2016'

Presented in Room 210 at 9:00 AM.

This study examined the US politicians' tweet with respect to immigrants, especially Muslim refugees, in order to identify cultural and political bias, which used to support their electoral campaigns and attract supporters, possessing anti-Muslim and anti-Immigration sentiments. The content analysis investigated the relationship between candidate's political affiliation (Democrat/Republican) and the type of politicians' tweet. A total of 100 tweets were assigned to analyze. The study found that a candidate's political affiliation proved to be a significant influencing factor in this respect, as Democratic candidate Hillary Clinton characterized immigrants and refugees in more positive terms, including a "good citizen" characteristic, while Republican candidate Donald Trump described immigrants and refugee mostly as "criminals" and "terrorists." on other words, there is a statistically significant relationship between a candidates' political affiliation and the coloring of tweets.

Mel Angelo

Academic School: Theatre and Dance

Majoring in Theatre

Presentation: 'The Price of Art'

Presented in Room 210 at 11:30 AM.

What is the Price of Art: the exploration of the character Sally Bowles, from Joe Masteroff's musical Cabaret. As required as part of the fulfillment for the Masters in Fine Arts from the University of Mississippi. Thesis includes research of the time period, origins of the musical, rehearsal process, and character development throughout one year culminating to a one weekend engagement. These five shows were preformed last November in the Tatum Theatre at USM. My oral presentation topics cover, 1930s Germany, The Rise of Hitler, backstreet cabarets, backalley abortion's, the LGBT community, and much more.



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Braden Bagley

Academic School: Communication

Majoring in Communication Studies

Presentation: 'Linguistic Agency in Disaster Messages: The Need for Separate Assignments for Threat and Efficacy'

Presented in Room 210 at 9:15 AM.

Linguistic agency is defined as a fundamental feature of language where the action or change in an event is ascribed to one or more involved entities. Public health campaign messages often use either human agentic or threat agentic language. The assignment of agency to either threat or human impacts message recipients' perceptions of threat and perceptions of efficacy. Therefore, the assignment of linguistic agency should be considered carefully when crafting public health messages. Manipulated versions of a message persuading recipients to download the FEMA mobile application, and a corresponding survey, were distributed to 340 participants. The purpose of this study was to determine if source credibility has a stronger impact on participants' perceptions of threat and efficacy when linguistic agency is assigned to disasters instead of humans. As predicted, high source credibility led to higher perceptions of threat in messages with linguistic agency assigned to disaster. However, when measuring perceptions of efficacy, messages with linguistic agency assigned to humans were more effective, contrary to our hypothesis. Finally, as predicted, high levels of perception of threat and perception of efficacy predicted the likelihood of participants accepting the invitation to download the mobile app. This study expands the linguistic agency scholarship because the existing literature has focused on individual health threats such as viruses, bacteria, and disease. However, natural disasters represent a more macro-level threat, thereby extending the literature into disaster-related communication. Results of this study can also help to inform message designers who are given the task of creating messages for public health campaigns.

Renee Bailey

Academic School: Humanities

Majoring in English

Presentation: "Like Cracker Crumbs:" Marianismo Culture in Sandra Cisneros' *Loose Woman*'

Presented in Room 210 at 10:00 AM.

Decades of feminist theory have made calls for action amongst women. Feminists ask to destroy the effects of silence and call on women to demonstrate their rage. The unfortunate results of women's rage concerns what happens after she speaks her rage. Sandra Cisneros expresses what happens when a woman rightfully verbalizes her victimization, particularly a victimhood that stems from marianismo culture, also known as the Cult of the Virgin. Cisneros' work testifies to injustices in her personal life, but in those injustices, Cisneros makes an example of her gender role's performative limitations and breaks through such limitations with her own angered performance.

As an illuminating precursor to Cisneros' poetry, Simone de Beauvoir's *Second Sex*, a formidable text for feminism, explores the myths of how women became the 'lesser' sex. Most notably, de Beauvoir introduces what she refers to as the "the cult of the virgin," a long historically derived depiction of the Mother of Christ, pure and free of sin. The Virgin Mary as symbol dates back to the reign of Pope Gregory's papacy in the late 500s AD, and de Beauvoir criticizes how, "[T]he mother kneels before her son: she freely accepts her inferiority. This is the supreme masculine victory, consummated in the cult of the virgin—it is the rehabilitation of woman through the accomplishment of her defeat."

What's important here is the intersectional devices that navigate the role of women, the destructive force behind the symbolic Virgin Mary, and the powerful voice in Cisneros' poetry which exemplifies and complicates the expectations of women in Catholic dominating cultures.

Shanda Barrett

Academic School: Interdisciplinary Studies and Professional Development

Majoring in Human Capital Development

Presentation: 'Exploring Resilience among Regional Innovation Intermediary Organizations'

Presented in Room 210 at 10:30 AM.

In the case of regional innovation ecosystems, economic inputs based on human ingenuity is the counter balance to economic inputs based on manufacturing and mass production. Stated simply, everything that happens in the innovation ecosystem is the result of human capital investments over a period of time. The current research proposes a qualitative examination of significant changes within the innovation ecosystem of Mississippi between 1994 and 2019. Innovation intermediary organizations will provide significant change stories to document the change within the ecosystem and will serve as a historical account for future qualitative evaluations of change in the Mississippi innovation ecosystem.

Over the past thirty to forty years, innovation-based economic development strategies have been diffusing into the economic development practitioner's playbook. Goal setting based on lagging indicators are used to measure innovation outputs based on quantifiable critical assets such as patents, human capital investments, number of incubators for entrepreneurial companies, etc. How well the goals and strategies have been adopted and implemented varies from region to region and some regions seem to make significant strides while others remain seemingly unchanged.

The proposed research takes a qualitative approach to understanding significant changes in an innovation ecosystem. The lived experiences of innovation intermediary organizations are explored to answer two questions: (1) What is the most significant change in the ecosystem during the last 25 years? (2) What is the capacity of existing innovation intermediary organizations for ongoing resilience in the ecosystem? The researcher proposes an appreciative inquiry approach to learning what is working in Mississippi; and to uncover what stakeholders believe they need to do better in the future. The researcher will deploy the most significant change data collection and data analysis process to collect significant change stories from regional innovation intermediaries and stakeholders in Mississippi.

Tyler Brandon

Academic School: Music

Majoring in M.M. in Music Theory

Presentation: 'Analyzing Modulation using Overtoneality'

Presented in Room 210 at 10:45 AM.

Overtoneality, as described by Daniel Harrison, is a method of musical analysis that uses the harmonic series as a basis for identifying the tonal center of a section of music. The analysis is aided by the use of an overtone frame, a musically notated representation of the harmonic series that highlights the relative strength or weakness of a particular note in comparison to the established tonal center. The weaker in strength that a note is on the overtone frame, the less that it suggests a particular tonal center. However, a note that is in a weak position on one frame may be in a stronger position on another frame. This serves as the basis for representing modulation through overtoneality. By comparing the overtone frames of two tonal centers in a piece of music, the process of modulation and the distance of a modulation may be analyzed. Daniel Pinkham's "Fanfare" from *Fanfare, Aria, and Echo* exhibits three distinct tonal centers: A, G, and C. An analysis through overtoneality provides a better understanding of how the modulation between these keys functions and how it is perceived. This type of analysis may be used to examine multiple types of modulations in a wide variety of pieces.

Margaret Bullerjahn

Academic School: Psychology

Majoring in Clinical Psychology

Presentation: 'Effects of Impulsivity and Perceived Poverty on Binge Drinking Behavior in At-Risk Adolescents'

Presented in Room 210 at 11:15 AM.

Impulsivity has been related to both normative and problematic alcohol use (Bates & Labouvie, 1995; Wood, Cochran, Pfefferbaum, & Arneklev, 1995); however, research suggests that impulsivity is more strongly associated with alcohol use when it is in conjunction with other factors such as personality (Whiteside & Lynam, 2009). Poverty is also related to alcohol use (Cerdá, Diez-Roux, Tchetgen, Gordon-Larsen, & Kiefe, 2010). Although they are both established risk factors, there is little research examining impulsivity and poverty together within the same model. The current study hypothesized that impulsivity would significantly predict binge drinking in a sample of at-risk adolescents, and predictive power would significantly improve when perceived poverty was added to the model.



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Javier Fernández Agüera

Academic School: Social Sciences and Global Studies

Majoring in Arts in the Teaching of Languages (Spanish & TESOL)

Presentation: 'Same-sex marriage: A study in the aspects of legal terminology'

Presented in Room 214 at 9:15 AM.

Same-sex marriage dates back to the beginnings of humanity, both in Western and Eastern cultures. Currently, it represents a situation of legal equality worldwide. Attitudes in society towards homosexual couples and, therefore, towards the formal unions of these couples, differs through time and space. The controversy comes from an array of religious, moral, and political factors, which lead to an ultimate linguistic and legal loophole. This study aims to answer the question of whether the term 'marriage' is adequate and accurate to refer to a same-sex union, by analyzing its sociolinguistic and sociopolitical background. Further terminological proposals will be provided in order to resolve this question, both in Spanish and English.

Maria Hernandis

Academic School: Social Sciences and Global Studies

Majoring in Teaching of Languages

Presentation: 'Accidental Interpreters: An analysis of their roles and support'

Presented in Room 214 at 9:00 AM.

Soldiers who have been deployed to Middle East conflicts declare that, without the 'accidental interpreters' with whom they worked, they would not have survived, let alone been able to fulfill their duties. Nonetheless, those interpreters are often accused of professional intrusion by professional translators and interpreters, considered traitors by many of their peers, and threatened and attacked when the troops they worked with are withdrawn. This presentation begins with a review of the connection between war and interpreting, mentioning some of the ethical and impartiality challenges faced by accidental interpreters. The main focus of the investigation is directed towards these interpreters' multiple roles and the initiatives intended to help them in the aftermath, when governments fail to deliver on their promises and abandon them to their fate.

Adam Moffett

Academic School: Music

Majoring in Music Theory

Presentation: 'Stravinsky's Double Canon: A Modern Approach to a Classic Form'

Presented in Room 210 at 11:00 AM.

Stravinsky's early serial period was a time of diverse experimentation. Before he worked exclusively with hexachord rotational arrays, he composed pieces using sets of various lengths, twelve tone rows, or more broad serial methods leading up to his mature serial works. One piece from this period has slipped under the radar of modern Stravinsky research: "Double Canon (for Raoul Dufy in memoriam)" from 1959. This brief string quartet fits a unique place in Stravinsky's serial writing of this time. In this paper, I will attempt to show the importance and unique advantages of Double Canon's place in Stravinsky's serial period by examining and comparing how he assembles canons in his Neo-classical period.

This string quartet is in fact a canon, but that can only be seen after examining the relationships between the different transformations of the row in each voice and how they form connections. Stravinsky also uses the meter and rhythm of the piece to emphasize both the serial and canonic nature of this piece, preserving and inverting the rhythms along with the row transformations. Stravinsky was no stranger to canons, but this is the only one composed during his serial period, so this string quartet provides ample insight into Stravinsky's changing compositional methods.

Chloé Wofford

Academic School: Humanities

Majoring in Creative Writing Poetry

Presentation: "The Victorian Lady and The Wild Woman: An Ecofeminist Reading of Tennyson's "The Lady of Shalott""

Presented in Room 210 at 9:45 AM.

While scholars have interpreted "The Lady of Shalott" in many ways, including gender-based, mythological, and biographical approaches in their research, none have captured the important role of Nature and its inexplicable relationship with the Lady and the interpretation of the poem. Indeed, Patrick Murphey, in his book *Literature, Nature, and Other: Ecofeminist Critiques*, states that, "While much feminist theory is either heavily enamored of psychoanalytic methods of analyzing women's subject construction or committed to socioeconomic models of interpretation, many theories ignore the 'places' in which women find themselves and the relation of environment to selfhood" (48). This relationship of the Lady to Nature and her ability to find transcendence into the wild woman is integral to a rich understanding and interpretation of the poem. First published in 1833 in Alfred Lord Tennyson's *Poems, Chiefly Lyrical*, and later revised and re-published in 1842, "The Lady of Shalott" serves as Tennyson's debut in writing Arthurian poetry, pre-dating his most famous "Idylls of the King" by approximately 25 years. And yet, it is in this poem that Tennyson grapples with the conflict between Victorianism and Romanticism, or rather, the refined Victorian lady and the Romantic wild woman. By using the allusion of Arthurian legend, Tennyson is able to challenge the patriarchal ideals of his time and illustrate the self-sustainable, autonomous wild woman that ultimately transcends societal norms and becomes at one with Nature. In examining both versions of the poem through ecofeminism, a literary lens used to examine the relationship between women and nature, I focus on a new interpretation of the relationship inherent between the Lady and Nature, the parallel and opposing relationship between Lancelot and Camelot, the full entailment of the Lady's curse, and the significance of the Lady's self-naming and transcendence into the wild woman.

Life, Health, Environmental, and Physical Sciences and Mathematics

Yetunde Adewunmi

Academic School: School of Biological, Environmental, and Earth Sciences

Majoring in Microbiology

Presentation: 'The antimicrobial activity and cellular pathways targeted by antimicrobial plant-derived aldehydes, aldehyde-based polymer networks (PANDAs) and natural inhibitors in *Pseudomonas aeruginosa*'

Presented in Room 218 B at 9:00 AM.

Phytoaldehydes have promising antimicrobial potential, but their broader use in the control of microorganisms is hampered by poor solubility, volatility, and knowledge gaps in their mode of action. To circumvent these issues, we developed PANDAs (Pro-Antimicrobial Networks via Degradable Acetals) capable of single and dual phytochemical delivery that effectively inhibits the growth of the multi-drug resistant pathogen *Pseudomonas aeruginosa* PAO1. We generated a gene knockout library of 10,000 transposon mutants in PAO1 and screened them for enhanced sensitivity to 4-methoxybenzaldehyde (a key component of PANDAs). We recovered 46 hypersensitive mutants (0.5% of mutant library) with mutations in genes encoding efflux pumps, porins, molybdenum cofactor biosynthesis complex and hypothetical proteins of unknown function. We tried to elucidate the role of multidrug resistance efflux pumps in the susceptibility of PAO1 to 4-methoxybenzaldehyde by combining it with epigallocatechin gallate (EGCG), a polyphenol from green tea. EGCG is known to inhibit efflux pumps and interfere with biofilm formation. We also combined 4-methoxybenzaldehyde with furaneol from strawberries, a quorum sensing inhibitor known to alter the production of virulence factors. We found that EGCG reduced the minimal inhibitory concentration of 4-methoxybenzaldehyde from 2.0mg/mL to 0.8mg/mL and established that EGCG and 4-methoxybenzaldehyde interact synergistically in suppressing biofilm formation in PAO1. Furaneol also significantly reduced biofilm formation, surface motility, and the amount of pyocyanin produced by PAO1. Studies are ongoing to determine the pattern and level of gene expression in PAO1 when exposed to 4-methoxybenzaldehyde and EGCG via RNA sequencing and real time qPCR. Results of this study will aid in the elucidation of cellular pathways targeted by plant-derived antimicrobials and help to combine these compounds for the increased efficacy against multidrug-resistant microorganisms.



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Sara Barrett

Academic School: School of Biological, Environmental, and Earth Sciences

Majoring in Biology

Presentation: 'Alternative stable state driving changes in fish assemblages within the Pascagoula River'
Presented in Room 218 B at 9:15 AM.

Ecosystems exist under sets of unique biotic and abiotic conditions, known as states, which support assemblages. Such state conditions may be defined as age of stage population components, and temporally or spatially averaged abundances of species or guilds. Perturbations may cause shifts in ecological states and can be either natural, anthropogenic or a combination of both. Natural disturbances may stem from extreme weather, floods, or fires, while urbanization and excess runoff are damaging anthropogenic effects to an ecosystem. Within southeastern Mississippi, the Leaf, Chickasawhay, and Pascagoula river are vital to the freshwater fish communities. The Pascagoula River is the last remaining un-impounded river in the United States with a discharge of over 2.4 cu mi per year. In observing the historical collections of the three major rivers above, we observed that there were initially five species that were abundant (*Cyprinella venusta*, *Trinectes maculatus*, *Pimephales vigilax*, *Notropis longisrostris*, and *Anchoa mitchelli*), and within the last years of sampling (2012-2017), we saw a switch in the species that were abundant (*Hybognathes nuchalis*, *Notropis atherinoides*, *Notropis texanus*, *Cyprinella venusta*, and *Anchoa mitchelli*). Current work is being done to determine what might have caused this shift, and if this newly discovered fish assemblage is an alternative stable state within the Pascagoula River, MS.



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Gabrielle Berry

Academic School: School of Biological, Environmental, and Earth Sciences

Majoring in Biology

Presentation: 'Turtle Communities in Southern Mississippi, comparing the Pascagoula River Drainage to the Highly Altered Pearl River Drainage'

Presented in Room 218 B at 9:30 AM.

Turtles are considered one of the most at-risk vertebrate groups in the world, with approximately 54% of species listed as threatened or endangered. Riverine turtles are a particularly diverse, albeit highly threatened group. Mississippi is located in a region ranked 2nd in the world in turtle biodiversity, and the state is home to over 20 species of freshwater turtles. However, distribution and abundance data are seriously lacking for numerous Mississippi turtle species as very few range wide surveys have ever been completed. Our goal was to assess the distribution and community assemblages of the riverine turtles within the Pascagoula River drainage, the largest unimpounded river system in the continuous U.S., and the highly altered Pearl River drainage. We used baited hoop nets to systematically trap 12 sites within the Pascagoula, and 14 sites within the Pearl. While likewise surveying basking turtles along each stretch for species we were unlikely to capture in traps. From May to September 2017, we surveyed the Pascagoula and captured 769 individuals from 11 different species, with an average of 6 species and 54 individuals per site. From May to September 2018, we surveyed the Pearl and captured a total of 345 individuals from 10 species, with an average of 6 species and 28 individuals per site. Overall, we captured significantly more (t-ratio = -2.82, df = 24, p = 0.0095) turtles per trap site in the Pascagoula drainage compared to the Pearl. The results of these surveys can be used as a baseline for future population studies assessing changes in diversity or relative abundance.

Anukool Bhopatkar

Academic School: Mathematics and Natural Sciences, Chemistry and Biochemistry

Majoring in Biochemistry

Presentation: 'Modulation of aggregation and phase behavior of pathogenic TDP-43 inclusions by granulins.'

Presented in Room 218 A at 10:45 AM.

Granulins (GRNs) are a family of small, cysteine-rich proteins produced from the proteolytic cleavage of the precursor protein called progranulin (PGRN). Seven complete GRNs (GRN 1-7) and one partial GRN domain are generated from proteolytic cleavage of PGRN. Besides being involved in a myriad of physiological functions, PGRN and GRNs have been implicated in frontotemporal dementia (FTD) and amyotrophic lateral sclerosis (ALS) and other neurodegenerative disorders. The biochemical hallmark of these disorders is the presence of cytoplasmic inclusions of a protein called TAR DNA binding protein (TDP-43) within the neuronal body. TDP-43 is also known to form liquid condensate stress granules by interacting with RNA in the cytoplasm. In-vivo studies have revealed the involvement of GRNs in exacerbating the toxicity of TDP-43 within the context of ALS and FTD, although the exact mechanistic details at a molecular level remain unknown. Here we studied the interaction of two GRNs; GRN-3 and 5 with TDP-43 and establish that GRNs, under redox control, modulate the aggregation and phase behavior of TDP-43. Specifically, the interaction of the reduced form of GRN-5 with TDP-43 is mediated via the liquid-liquid phase separation of the two proteins which drives the transition of TDP-43 to the pathologically relevant fibrillar form. Such phase transition was absent in case of GRN-3 interaction with TDP-43, which formed fibrils rapidly. These results could potentially allow the identification of the biochemical steps in the pathological pathways relevant to ALS-FTD.



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Logan Blancett

Academic School: School of Biological, Environmental, and Earth Sciences

Majoring in Microbiology

Presentation: 'The *Histoplasma capsulatum* stress-response protein HcDDR48 decreases the activity of intracellular catalases and superoxide dismutases resulting in decreased survival under oxidative stress conditions'

Presented in Room 218 B at 9:45 AM.

Histoplasma capsulatum (Hc) is a systemic, dimorphic fungal pathogen. Hc grows as a multicellular mold at environmental temperatures (25°C) whereas, upon inhalation into a human or other mammalian host (37°C), it transforms into a unicellular, pathogenic yeast. Our research is focused on characterizing the cellular stress response protein HcDDR48. Literature in *C. albicans* has shown that CaDDR48 is required for optimal survival in oxidative stress-promoting conditions. This study aimed to investigate if HcDDR48 plays a role in oxidative defenses in *Histoplasma* as well. Our data demonstrates a decreased survival of Hc yeasts in a *ddr48* mutant when grown in the presence of the oxidative stress generator, paraquat. Furthermore, we identified a set of genes, mainly intracellular catalases and superoxide dismutases, whose transcriptional response to oxidative stress is modulated in a HcDDR48-dependent manner. We also determined that under optimal growth conditions the *ddr48* mutant had decreased basal levels of catalase and superoxide dismutase enzymatic activities. We demonstrate the importance of maintaining a function copy of HcDDR48 in order to sense and respond to numerous environmental and host-associated stressors. Our studies indicate that HcDDR48 far exceeds its role in DNA damage response, and likely plays a critical role in sensing and responding to a broad range of environmental stimuli.



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Grover Brown

Academic School: School of Biological, Environmental, and Earth Sciences

Majoring in Biological Sciences

Presentation: 'The Evolutionary Histories and Ecologies of Two Sympatric Musk Turtle Species (Genus *Sternotherus*) in the Pascagoula Drainage'

Presented in Room 218 B at 10:15 AM.

The southeastern United States is a global turtle diversity hotspot, yet despite nearly a century of prolific publication, even some of the most common species remain understudied. A case in point are the humble musk turtles (Genus: *Sternotherus*). In South Mississippi, the Pascagoula River System marks an intriguing region for two of the genus' lotic species. The Pascagoula is near the westernmost extent of the Stripe-necked Musk Turtle's (*Sternotherus peltifer*) geographic distribution and is the easternmost extent of the Razorback Musk Turtle's (*S. carinatus*) geographic distribution. This narrow range of overlap between two ecologically similar turtle species provides interesting insight to the forces that create and maintain turtle biodiversity in the region. Where the two musk turtle species are allopatric, they occupy nearly identical lotic habitats and fulfill a very similar ecological niche, such that in sympatry they seemingly violate the "Principle of Competitive Exclusion." To better understand how these species are able to co-occur within the Pascagoula River Drainage, we examined their interaction by 1) using nuclear and mitochondrial markers to determine if species are hybridizing, and 2) comparing species' habitat preferences within the Pascagoula River System to evaluate levels of niche overlap. To date we have caught 202 *S. peltifer* and 189 *S. carinatus* from the Pascagoula River System, making this the largest study of *Sternotherus carinatus* and *S. peltifer* to date.

Damayanti Chakravarty

Academic School: School of Biological, Environmental, and Earth Sciences

Majoring in Microbiology

Presentation: 'Transcriptomic analysis of *Listeria monocytogenes* in response to bile under aerobic and anaerobic conditions'

Presented in Room 228 at 9:00 AM.

Listeria monocytogenes is a dangerous foodborne pathogen and causes the disease listeriosis. The gram-positive facultative anaerobe can tolerate the stressors it encounters in the gastrointestinal tract, such as bile, acidic conditions, oxygen availability etc. Previous data have suggested that oxygen and bile availability influence the stress response. It has been observed that bile resistance of *Listeria monocytogenes* strain F2365 increases under anaerobic condition. It was hypothesized that genes involving oxidative stress response, invasion, Stress recognition and response will be differentially regulated under conditions mimicking different parts of the GI Tract. The aim of this study was to determine how the differential gene expression of *L. monocytogenes* strain F2365 is regulated under conditions, which mimics the physiological environment of the GI Tract. Whole transcriptomic analyses were carried out using RNA isolated from *Listeria monocytogenes* F2365 at both aerobic and anaerobic conditions, upon exposure to 0% and 1% bile at acidic and neutral pH. Gene Ontology analysis indicated that genes responsible for invasion, adherence, removal of superoxide radicals, stress response etc. are upregulated upon exposure to the mimicking conditions. Hence, this study demonstrates that upon exposure to these conditions, stress response of *Listeria monocytogenes* F2365 is differentially regulated which may impact its pathogenicity

Bohan Chen

Academic School: School of Biological, Environmental, and Earth Sciences

Majoring in Molecular Biology

Presentation: 'Attenuated Type II Interferon Response in Mouse Embryonic Stem Cells and the Molecular Basis'

Presented in Room 228 at 9:15 AM.

Innate immune property, which is well-developed in most somatic cells, is known as one of the first lines of defense against various pathogen infections. However, our recent studies have demonstrated that embryonic stem cells (ESCs) are deficient in innate immune responses to viral/bacterial infections and inflammatory stimuli like LPS and TNF α . Here, we extend our investigation to ESCs' response to type II interferon-IFN γ . It is one of the most common and highly presented inflammatory cytokines during early embryogenesis and other inflammatory conditions, which can induce robust inflammatory responses in somatic cells. In this study, ESC differentiated fibroblast cells (ESC-FBs), which were proved to have partially developed innate immunity, were used as a positive control for ESCs. We first determined the effects of IFN γ on cell viability and inflammatory molecules expressions in ESCs and ESC-FBs. We demonstrated that ESCs were not susceptible to the cytotoxic effects from IFN γ and showed attenuated expressions of inflammatory molecules as compared to ESC-FBs. Furthermore, transcription factor STAT1, which is responsible for IFN γ signal transduction, was not activated in ESCs. While we also demonstrated that ESCs expressed functional receptors for IFN γ , the basal level of protein phosphatases that inhibit IFN γ pathway are significantly higher in ESCs than ESC-FBs. Treating ESCs with protein phosphatases inhibitor significantly upregulated the expression of IFN γ induced signaling molecule. We conclude that ESCs have attenuated responses to type II interferon and the high basal level expression of protein phosphatase in ESCs could, at least in part, explain their attenuated responses to IFN γ .

Annmarie Fearing

Academic School: School of Biological, Environmental, and Earth Sciences

Majoring in Marine Biology

Presentation: 'The Use of Natural History Collections to Assess the Historic Levels of Genetic Diversity in a Critically Endangered (IUCN) Elasmobranch'

Presented in Room 228 at 9:30 AM.

The Critically Endangered (IUCN) largemouth sawfish is among the most threatened of the marine fishes. Largemouth sawfish have experienced large declines over the past century, going from a historically circumtropical distribution, to current, 'viable' populations being largely limited to northern Australia. When populations suffer large declines, these declines are typically accompanied by reduced levels of genetic diversity. When populations have low levels of genetic diversity they are typically considered less 'fit' and more prone to disease, inbreeding, and have a reduced ability to adapt to a changing environment. It is unknown whether contemporary largemouth sawfish populations have suffered from a reduction in the levels of genetic diversity over the past century or if their levels of genetic diversity have stayed the same despite declines. One way to quantify change in genetic diversity is to compare the levels of genetic diversity in contemporary populations to those of historic populations. Remnants of historic largemouth sawfish populations exist in natural history collections as old dried sawfish saws that were taken as trophies in the late 18th century and early-to-mid 19th century. Using tissue from these historic saws, DNA can be gathered, amplified, and analyzed to assess the levels of genetic diversity in historic populations. The DNA in historic specimens tends to be degraded, so we targeted smaller DNA fragments, of about ~150 base pairs each, to amplify and sequence the mitochondrial control region. These data can provide baseline information about largemouth sawfish that can be used to assess their long-term survival potential. If the levels of genetic diversity are shown to be considerably higher in historic largemouth sawfish populations then it is vital for conservation plans to protect the remaining genetic diversity within and between 'viable' contemporary populations.

Mona Fendereski

Academic School: School of Biological, Environmental, and Earth Sciences

Majoring in Cellular Biology

Presentation: 'Characterization Of Innate Immunity In Mouse Embryonic Stem Cells, Trophoblast Stem Cells, And Their Differentiated Cells'

Presented in Room 228 at 9:45 AM.

Innate immunity is an evolutionarily conserved defense mechanism presumably developed in all cell types. Innate immune system can be activated by various immune stimuli, leading to the expression of interferons (IFNs) and inflammatory cytokines that participate in different aspects of immune and inflammatory responses. Surprisingly, our recent studies demonstrated that mouse embryonic stem cells (ESCs) are deficient in innate immune responses. In particular, they are deficient in expressing IFNs and lack responses to bacterial endotoxin and inflammatory cytokines. This finding challenges the concept of innate immunity as an inborn defense mechanism. ESCs are derived from inner cell mass of the blastocyst, the early embryo which is surrounded by trophectoderm that gives rise to placenta. In this study, we extended our investigation to determine the immunoproperties of mouse trophoblast stem cells (TSCs), the progenitors of placental cells. Through in vitro differentiation, we are able to differentiate TSCs into trophoblast giant cells (TGCs), the primitive placental cells. We tested the responses of TSCs and TGCs to LPS and TNF α , two inflammatory agents that strongly induce inflammatory responses in embryonic fibroblasts. Both TSCs and TGCs failed to respond to LPS and TNF α as assessed by inflammatory gene induction and the lack of NF κ B activation, the transcription factor that mediates the effects of LPS and TNF α . Surprisingly, TSCs can express IFN β , suggesting that they have a functional IFN antiviral mechanism. Our data suggest that the immunologic properties of TSCs and ESCs are developmentally different, therefore may have important implications during early embryogenesis.



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Bibek G C

Academic School: School of Biological, Environmental, and Earth Sciences

Majoring in Biological Sciences

Presentation: 'msaABCR Operon Regulates Weak Acid Dependent Cell Death During Staphylococcal Biofilm Formation'

Presented in Room 218 B at 11:15 AM.

Key problem with *Staphylococcus aureus* as a pathogen is the acquisition of antibiotic resistance and their ability to enhance biofilm formation under sub-inhibitory antibiotic stress. Studies indicate that a subpopulation in *S. aureus* undergoes tightly regulated programmed cell death (PCD) during biofilm development. Previously, we showed that deletion of msaABCR operon led to increased cell death during biofilm formation. However, the mechanism behind unregulated cell death in msaABCR mutants' biofilm is still unknown. To define the role of msaABCR in cell death during biofilm formation, we performed biofilm formation assays under antibiotic stress condition. We performed stationary phase survival assays, glucose consumption, and acetate generation under biofilm microenvironment mimic condition. Finally, we measured the expression of genes involved in PCD in msaABCR mutants and studied if MsaB regulates these genes directly using chromatin-immunoprecipitation. We observed that sub-inhibitory concentration of vancomycin induces biofilm formation but failed to do so in the msaABCR mutant. msaABCR mutant consumed glucose and produced acetate at a higher rate compared to wild type in biofilm microenvironment leading to increased cell death. Survival of msaABCR mutant was reversed to wild type level in presence of MOPS buffered condition. Deletion of msaABCR resulted in increased expression of cidR regulon that has been shown to play role in cell death mechanism. Preliminary data suggest direct binding of MsaB to CidA and cidR promoter. These results suggest that msaABCR directly regulates cidR regulon to control weak acid dependent programmed cell death phenomenon during biofilm formation.

Chandan Gurung

Academic School: School of Biological, Environmental, and Earth Sciences

Majoring in Cell and Molecular Biology

Presentation: 'The role of dicer in suppressing type I interferon signaling in mouse embryonic stem cells'

Presented in Room 218 A at 10:15 AM.

RNA interference (RNAi) is a well-established antiviral mechanism in plants and invertebrates. Double stranded viral RNA (dsRNA) produced during virus replication are processed by dicer enzyme into short interfering RNA (siRNA), which in turn target viral RNA, thereby inhibiting virus replication. Whether or not RNAi antiviral mechanism operates in vertebrate cells, which mainly utilize interferon (IFN)-based antiviral system, is a highly controversial subject. A series of our recent studies have demonstrated that IFN system is underdeveloped in mouse embryonic stem cells (ESCs). This finding brings up an interesting question as to how ESCs differ from somatic cells in dealing with virus infection. We hypothesize that RNAi could be active in ESCs in which the IFN system has not yet developed. Using synthetic dsRNA that target green fluorescent protein (GFP) as a virus-free RNAi model, we indeed detected RNAi activity in wild-type ESCs but not in dicer knockout ESCs (DKO-ESC), suggesting that dicer-dependent RNAi is biochemically functional in ESCs. While whether or not this dicer-mediated RNAi activity is used as in vivo antiviral activity in ESCs remains to be determined, a surprising finding from this study is that the basal expression levels of IFN β and the signaling molecules in the IFN-pathway were significantly higher in DKO-ESCs than ESCs, and they were further upregulated in response to synthetic dsRNA viral analogs. These findings suggest that the underdeveloped IFN system, which has been considered as an intrinsic property of ESCs, may in fact be functional but normally suppressed by dicer.

Alison Hart

Academic School: Mathematics and Natural Sciences, Chemistry and Biochemistry

Majoring in Chemistry

Presentation: 'Enantioselective Addition of Masked Acyl Cyanides to β -Nitrostyrenes'

Presented in Room 218 A at 11:00 AM.

The use of umpolung reactivity has been a critical tool in organic synthesis to access natural products with unnatural synthetic connectivity. Masked Acyl Cyanides (MAC) reagents have been of particular interest recently for their innate umpolung reactivity and enabling access to a wide variety of organic compounds that are otherwise difficult to synthesize. Of note is their use as nucleophiles for 1,2; 1,4; and 1,6 additions, giving access to a variety of bioactive compounds. Additionally, MAC reagents have been used in tandem with organocatalysts to create enantioselective adducts. Our research focuses on the enantioselective 1,2 Michael addition of MAC to β -nitrostyrenes (β -NS) using squaramide organocatalysts. An extensive substrate screen will be shown with both alkyl and aryl nitroalkenes, as well as reaction parameters. Additionally, it will be shown that these adducts can act as a precursor to the enantioselective synthesis of β - amino acids, β -lactams, and 3-carboxylate indolines.

Joshua Hubbell

Academic School: School of Biological, Environmental, and Earth Sciences

Majoring in Biology

Presentation: 'Patterns of occurrence and co-occurrence of three darters within the genus *Etheostoma* across the Little Tallahatchie River System.'

Presented in Room 218 A at 9:00 AM.

Patterns of occurrence and co-occurrence among many North American freshwater fishes are poorly understood. In headwater systems, where abiotic forces drive patterns of occupancy and abundance, it is feasible that closely related species may be able to co-occur due to the harshness of local environmental conditions. The Yazoo darter, *Etheostoma raneyi*, the gold stripe darter *Etheostoma parvipinne*, and the redspot darter *Etheostoma artesia*, are headwater specialists and are distributed across the Upper Little Tallahatchie River system. In this study, we assessed patterns of occurrence and co-occurrence of these three darters within this river system. We utilized occupancy and species distribution models to address multiple hypotheses regarding patterns of occurrence and co-occurrence of all three darters. We tested the predictions that: 1- *E. raneyi*, *E. parvipinne*, and *E. artesia* are habitat limited across multiple spatial scales 2- Coexistence among species pairs is a result of habitat partitioning, and thus the occurrence one of species does not affect the occurrence of the other, And 3-As a result of reduced phylogenetic relatedness, darter pairs will not co-occur more or less often than would be expected, and thus the detection or occurrence of one species will not affect the detection or occurrence patterns of another species. Evidence from our results suggests that (1) species were habitat limited across multiple spatial scales, (2) co-occurrences among all darter pairings were a result of habitat partitioning and (3) the detection or occurrence of one species did not influence the detection or occurrence of another species. Our results suggest that the separate evolution of these darters allows for their coexistence within this system. Therefore, we propose that co-occurrence patterns exhibited by these species is a result of discrepancies in habitat preference at the landscape scale (e.g., stream size, groundwater discharge) and variability in local scale attributes (e.g., depth).

Lauren Kennedy

Academic School: School of Biological, Environmental, and Earth Sciences

Majoring in Microbiology

Presentation: 'The thiol specific antioxidant (Tsa1) gene is required for protection from oxidative attack in the pathogenic fungus *Histoplasma capsulatum*'

Presented in Room 218 A at 9:15 AM.

Histoplasma capsulatum (Hc) is a pathogenic fungus that is the etiologic agent of the common respiratory disease histoplasmosis in humans and other mammals. *Histoplasma* undergoes a dimorphic shift from the mold growth form to the yeast morphotype which is required for pathogenesis. Work in our lab has indicated that a thiol-specific antioxidant gene (HcTsa1) plays a role in survival and virulence. In other fungi, the Tsa1 gene has been shown to be involved in cell wall synthesis (*Candida albicans*) and protection from oxidative stress (*C. albicans* and *Saccharomyces cerevisiae*). HcTsa1 is strongly upregulated in the yeast (pathogenic) morphotype. To analyze the role of Tsa1 in response to oxidative stress, a RNAi Tsa1 knockdown strain (90% knockdown) was created. The knockdown strain has a growth deficit, particularly in nutrient limited media. Similarly, the knockdown mutant is more sensitive to the oxidative stressor paraquat, which emulates the oxidative attack of host macrophages upon the invading organism. Work is ongoing to examine the impact of the oxidative stressor hydrogen peroxide. Additionally, we are investigating the role of the functional Tsa1 precursors thioredoxin (Trx1) and thioredoxin reductase (Trr1) enzymes. We are also investigating other antioxidant genes in Hc, such as superoxide dismutase (Sod1), catalase (CatB), and glutathione peroxidase (Gpx) in the wild type, knockdown, and null strains before and after exposure to oxidative stress chemicals. These studies will help elucidate the role of HcTsa1, in particular, and oxidant protection genes, in general, in virulence and survival of this important pathogen of man.



2019 Susan A. Siltanen Graduate Student Research Symposium April 11, 2019

Ryan Lehman

Academic School: School of Biological, Environmental, and Earth Sciences

Majoring in Biology

Presentation: 'Sawfish CSI: Using environmental DNA samples to assist in monitoring the recovery of the Critically Endangered Smalltooth Sawfish in United States (U.S.) waters'

Presented in Room 218 B at 10:30 AM.

The Critically Endangered Smalltooth Sawfish, *Pristis pectinata*, was once common throughout the Gulf of Mexico, but experienced a significant reduction in range and abundance in the last century, with populations currently restricted to the waters off of Southwest Florida. Due to over fifteen years of concentrated scientific research and public outreach efforts, these restricted populations may have stabilized; however, their occurrence outside of core habitats is not well understood. Over the past decade, juveniles have been sporadically reported in historically occupied habitats within the northern Gulf of Mexico by recreational fishers, implying this species may still be present, or is recovering. Reports of juveniles, which are known to exhibit site fidelity, are promising and suggest they may be using these waters as nurseries. Given the low number of reports, environmental DNA (eDNA) surveys, conducted by collecting and analyzing water samples, can be a powerful, cost-effective tool for assessing occurrence in these previously occupied regions as long as strict protocols are implemented to avoid cross contamination, and avoid both false positives and false negatives. eDNA surveys could be used for the early detection and monitoring of this species' presence, and assist with on-going recovery planning by focusing outreach efforts and fieldwork. To begin to understand the status of *P. pectinata* in this region, we have designed, optimized, and validated a species specific genetic assay on the Droplet Digital PCR (ddPCR) platform, and conducted eDNA surveys in areas with recent public encounter reports, specifically in the Mississippi Sound. If *P. pectinata* are reintegrating into historic portions of their range, it is imperative to designate and protect any critical region(s). Given the rapidly expanding interest in eDNA research, communicating the research process to interested researchers will support sawfish recovery worldwide, especially in remote regions where field work is logistically difficult.

Sneharika Lingampally

Academic School: Health Professions

Majoring in Public Health (Epidemiology and Biostatistics)

Presentation: 'Reducing Participant and Researcher Burden of the National Cancer Institute Dietary Screener Questionnaire'

Presented in Room 216 at 11:00 AM.

Dietary assessment tools, such as the Dietary Screener Questionnaire (DSQ), are burdensome to complete and have complicated scoring methods which may lead to errors and limited usability of survey measures. Identifying constructs based on fewer items and simpler scoring may reduce burden on participants and experimenters and increase usefulness of the measure. Objective: The purpose of this study was to 1) reduce the number of items and simplify scoring methods for three multiple-item subdomains of the DSQ and 2) test the resulting subdomain scores to determine whether real-world relationships are maintained with fewer items and alternative scoring. Method: All possible subsets regression was used to reduce the number of items and maximize R² with the fewest items for three dietary subdomains of the DSQ – added sugar (eight items), sweetened beverages (three items) and fruits and vegetables (seven items). The original composite variable, having all items and complicated composite scoring techniques was regressed onto each item, each combination of two items, and so on up to all combinations of four items. Combinations of items having the largest R² values were then summed to form simple composites. The original composite variables and simple composite variables were then submitted to moderated multiple regressions (MMR) to determine whether the pattern of results for the simple composites was similar to that for the original composites. Results: R²s ranged from 0.15 to 0.93 across the three dietary subdomains with a reduced subset of two, four and four items explaining 89%, 93% and 89% of the variance in sweetened beverages, added sugar, and fruits and vegetables, respectively. MMR results were similar for simple and original composites. Conclusion: Fewer items and less complicated scoring methods can reduce both respondent and experimenter burden and result in measures that are used by a wider variety of researchers.

Hannah Masoner

Academic School: Psychology

Majoring in Brain and Behavior

Presentation: 'Posture Affects Affordance Perception of Reachability in Virtual Reality'

Presented in Room 216 at 10:45 AM.

Tasks such as walking, reaching, and standing require differing levels of postural stability. Postural equilibrium is necessary to perceive the location of objects (Lee, Pacheco, & Newell, 2018). This study compared affordance (Gibson, 1979) judgements of reachability between tasks that place different constraints on maintaining balance. The method included a 3D virtual reality (VR) environment with a stimulus object placed at different distances from the observer. Using a within subjects design, participants were asked to make judgements on reachability while in a standard stance condition as well as two separate active balance conditions (yoga tree pose, and toe-to-heel pose). Feedback on accuracy was not provided, and participants were not allowed to attempt to reach. Response time, affordance judgments (reachable, not reachable), and head movements were recorded on each trial. Specifically, head movement time series were recorded by harnessing position data from the Oculus Rift VR goggles. Consistent with recent research on reaching ability (Weast & Proffitt, 2018), the reachability boundary occurred around 120% of arm length, indicating overestimation of perceived action capability. Response times increased with distance, and were smallest for the most difficult yoga tree pose, suggesting that in order to maintain a difficult pose, responding had to be sped up. Head movement amplitude and total amount of movements increased with increases in balance demands. Surprisingly, the coefficient of variation was comparable in the two poses that had increased balance requirements, and was more extreme in a less constrained, ostensibly easier pose for the shortest and longest distances, indicating a pose by distance interaction. The insights gathered from this study will provide a fuller understanding of the perception of affordances in everyday tasks such as reaching and grasping.



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Shanti Pandey

Academic School: School of Biological, Environmental, and Earth Sciences

Majoring in Microbiology

Presentation: 'The *msaABCR* operon regulates persister cells formation via proton motive force dependent gentamycin uptake in *Staphylococcus aureus*'

Presented in Room 218 B at 10:45 AM.

A bacterial phenotypic variant that shows extreme antibiotic tolerance are termed as 'persister cells'. Increasing evidences suggest the association of bacterial persisters with chronic and recurrent infections. Despite this clinical relevance, there are currently no viable means for eradicating persisters. Previously, we showed the involvement of *msaABCR* operon in in-vitro persister cells formation in *Staphylococcus aureus* against different antibiotics. Particularly, on exposure to gentamycin, we observed no persister formation in stationary phase Δ *msaABCR* cells within 24 hours of treatment while the wildtype and the complementation strains formed persister cells for extended period. Given the gentamycin uptake is dependent on the proton motive force, we hypothesized that deletion of *msaABCR* renders cells to have increased proton motive force consequently increasing the gentamycin-uptake in *S. aureus* cells. We measured the gentamycin uptake using gentamycin-Texas red conjugation method by flow cytometry and found the drug uptake is more in Δ *msaABCR* cells as compared to wildtype *S. aureus* cells. Herein we report, the regulatory role of *msaABCR* operon in persister formation that is dependent on the proton motive force. This study highlights the importance of *msaABCR* operon as a drug target for eradicating staphylococcal persisters and overcome recalcitrant infections.

Luke Pearson

Academic School: School of Biological, Environmental, and Earth Sciences

Majoring in Biology

Presentation: 'Status of the Alligator Snapping Turtle (*M. temminckii*) in Mississippi'

Presented in Room 218 A at 10:00 AM.

The alligator snapping turtle (*Macrochelys temminckii*) is currently under review by the US Fish and Wildlife Service and other regulatory and management agencies to determine if populations have declined sufficiently to warrant federal listing as a threatened species. Despite having a presumed near-statewide distribution, there is a paucity of records for *M. temminckii* in Mississippi, thus leaving a void of knowledge at the core of this species' geographic range. Therefore, our goal was to assess the status of *M. temminckii* within the Pascagoula, Pearl, and Big Black river systems. We systematically trapped 17 sites within the Pascagoula River, 14 sites within the Pearl River, and 3 sites within the Big Black River. In the Pascagoula River drainage, 124 *M. temminckii* were captured, averaging 0.16 turtles per trap night (0 – 0.30 TTN), while only 92 *M. temminckii* were captured in the Pearl River drainage (mean = 0.11 TTN; 0 – 0.21 TTN). The Big Black River had the highest capture rates of the drainages sampled so far, averaging 0.38 TTN (0.19 – 0.62 TTN), with high abundances of both available microhabitat and small juvenile *M. temminckii* (14 – 18 cm CL). Alligator snapping turtles were captured at all but two sampling sites, and the abundance of juveniles captured at most sampling locations in the Pascagoula, Pearl, and Big Black river drainages is an encouraging sign of potentially ongoing recruitment in these populations. In contrast, the lack of large adults is concerning, which could be a legacy effect of historical commercial harvest and/or by-catch mortality on fishing equipment (e.g. trotlines).

Jhinuk Saha

Academic School: Mathematics and Natural Sciences, Chemistry and Biochemistry

Majoring in Biochemistry

Presentation: 'Amyloid- β ($A\beta$) oligomerization in the presence of phospholipid micelles and vesicles'

Presented in Room 218 A at 11:15 AM.

Soluble, low molecular weight amyloid- β ($A\beta$) oligomers have emerged as the main toxic species involved in the Alzheimer disease (AD) pathogenesis. Interfaces such as membrane lipids have been found to significantly affect $A\beta$ in generating oligomers and fibrils. Results from our laboratory suggest that oligomers generated in the presence of micellar lipids faithfully propagate their mesoscopic structure. We hypothesize that modulation of $A\beta$ aggregation by membrane lipids and surfactants to generate distinct oligomer strains with distinct biophysical and biochemical properties, and potentially give rise to distinct clinicopathologic phenotypes in the AD brains. Here, we investigated the characteristics of $A\beta$ oligomers generated in the presence of GM1 ganglioside, anionic phospholipid micelles and liposome in-vitro. The anionic phospholipid micelle catalyzed the formation of oligomers that could be isolated free of lipids. However, oligomers formed in the presence of GM1 ganglioside are isolable in lipid complexed form. All oligomers are comprised of parallel β -sheets, and have similar molecular weight and hydrodynamic diameter. The melting temperatures for all lipid-derived oligomers fall in the same range indicating that they have similar thermodynamic stabilities. Overall, micellar lipids seem to generate a family of oligomers with related biophysical properties. Extensions of this work using liposomes is currently underway. Significance of these results in potential AD phenotypes will be presented and discussed.



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Loren Stearman

Academic School: School of Biological, Environmental, and Earth Sciences

Majoring in Biology

Presentation: 'Hierarchical Spatial Patterns of Co-occurrence of Ecologically Similar Fishes in the Pascagoula River, Mississippi'

Presented in Room 218 B at 11:00 AM.

How do ecologically similar species coexist? Factors influencing local assemblage structure are hypothesized to occur in a spatial and temporal hierarchy. Historical and abiotic processes influence greater spatial and temporal scales than the biotic processes which should cause exclusion of ecologically equivalent taxa. Within this framework, biotic interactions (e.g., competition, facilitation) are hypothesized to be far less important in structuring assemblages where these assemblages are subjected to stochastic or harsh environments. Stream fishes in the southeastern United States present a particularly fascinating case of coexistence. Several taxonomic groups (e.g., the minnows Cyprinidae) have undergone adaptive radiations and co-occurrence of apparently ecologically similar taxa within many of these groups is quite common. Stream environments are also particularly stochastic, subject to disturbances such as floods and droughts. However, detecting consistent patterns predicted by biotic structuring (i.e., the “checkerboard” spatial pattern) or relationships involving environmental stability requires long-term datasets, which have until recently not been common in the southeastern United States. We explore one such long-term dataset collected on National Forest land in Mississippi to ascertain patterns of co-occurrence in three speciose fish families (Cyprinidae, sunfishes, Centrarchidae, and darters, Percidae) in the Pascagoula River basin. We test the hypothesis that local biotic structuring should result in a pattern of positive occurrence (association) at the scale of kilometers and negative co-occurrence (exclusion) at a scale of tens of meters among ecologically similar taxa, but that this pattern should be mediated by gradients of ecological stability (e.g., stochastic and spatially variable headwaters to stable and spatially consistent mainstem habitats).

Joshua Tropp

Academic School: Polymer Science and Engineering

Majoring in Polymer Science and Engineering

Presentation: 'Contemporary Polymer Sensing Technologies for Gulf Coast Water Quality Monitoring'

Presented in Room 218 A at 11:30 AM.

This project outlines the design of a four-year collaborative enterprise to design new sensing technologies for deployment in the marine environment for detection of pollutants (phosphates, polycyclic aromatic hydrocarbons (PAHs), and heavy metals). New modular receptor-analyte interactions capable of transducing an analyte-binding event into a useable signal were designed and evaluated. The reported approaches span a wide range of disciplines including synthetic chemistry, polymer science, analytical chemistry, and statistics. Modular synthetic approaches, thiol-ene click chemistry, linear discriminant analysis, and the inner filter effect were leveraged to detect marine pollutants using conjugated polymer-based sensors. Inorganic phosphate was detected at parts-per-billion concentrations (± 6 nM) in seawater conditions, a mixture of 16 PAHs were detected and discriminated, and a complex mixture of heavy metals was detected and discriminated in aqueous solution at parts-per-billion concentrations. The comprehensive set of approaches outlined should offer valuable insight toward future sensing technologies utilizing conjugated polymers.

Margaret Waldron

Academic School: School of Biological, Environmental, and Earth Sciences

Majoring in Geography

Presentation: 'Detecting Coastal Marsh Change from Aerial Imagery using Spectral and Textural Methods: Pascagoula River Estuary, MS, 1955-2014'

Presented in Room 218 A at 9:30 AM.

As sea level rise accelerates, coastal marsh ecosystems are increasingly vulnerable. Vertical accretion must exceed or keep pace with sea level rise to prevent transition to open water or inland migration of marsh vegetation. While some marsh systems along the northern Gulf of Mexico coast have remained stable, others, e.g., the marshes of the Louisiana Gulf Coast, have experienced high rates of conversion to open water. This study examined the historical extent of intertidal marsh at the mouth of the Pascagoula River in Jackson County, MS to determine whether marsh extent decreased during the period 1955-2014 and to ascertain areas which experienced high degrees of change. Marsh extent was mapped at 3 meters GSD using spectral and textural aerial image data for image dates of February 13, 1955, February 12, 1996, and October 5-16, 2014. Waterways were classified using infrared and textural data, and land cover was classified into three groups—marsh, woodland/shrubs, and unvegetated—using a Maximum Likelihood classification scheme. Change detection analysis revealed a net marsh loss of 1314.4 ha (19.9%) between 1955 and 2014; classified marsh extent decreased by 1068.3 ha (16.1%) between 1955 and 1996, and 246.1 ha (4.4%) between 1996 and 2014. Linear regression of classified marsh extent in hectares with year yielded a slope of -22.9 ha/year ($r^2=0.984$, $p=0.08$). The study area was subdivided into four zones, equidistant from north to south, to assess differences in rates of marsh change. Marsh extent decreased in every zone between 1955 and 2014, with the highest rate of marsh loss in the most inland zone and the highest rates of marsh conversion to open water in the two most marine zones. The results indicate that marsh extent will continue to decrease in the estuary.



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Helen Weber

Academic School: School of Biological, Environmental, and Earth Sciences

Majoring in Population Genetics

Presentation: 'Population structure of the Atlantic cownose ray, *Rhinoptera bonasus*, in the Western Atlantic'

Presented in Room 218 A at 9:45 AM.

The Near Threatened Atlantic cownose ray, *Rhinoptera bonasus*, is a highly migratory batoid that is found continuously along the continental coast from southern New England, U.S.A. to southern Brazil. *Rhinoptera bonasus* utilize estuary and river systems along shorelines, with migration between seasonally utilized reproduction and overwintering grounds. Close proximity to shorelines puts *R. bonasus* at risk of exploitation, as they travel near the waters surface and within the range of commercial and recreational fisheries, where they are caught both intentionally and as bycatch. With late maturity, strong reproductive philopatry, and one of the lowest fecundities among all elasmobranchs, it is unlikely that *R. bonasus* can withstand exploitation. *Rhinoptera bonasus* was assessed as Near Threatened in 2006 based on life history and fishing pressure in the southern portion of its range, prior to increased threats in the northern portion of its range, and the discovery that the morphologically similar species, *Rhinoptera brasiliensis*, was likely inflating population estimates. Additionally, although the species is documented throughout a continuous region, the species may have differing migratory routes and reproductive grounds, which may lead to population structure. To assess population structure, we collected 385 *R. bonasus* tissue samples from 27 sites throughout their range and analyzed DNA sequence data for a 442-base pair fragment of the mitochondrial gene NADH dehydrogenase subunit (ND2) gene. The resultant data will improve our understanding of the population ecology of *R. bonasus* and can be used to define biologically appropriate management units across the range of this species.

Shayne York

Academic School: Kinesiology and Nutrition

Majoring in Biomechanics

Presentation: 'Impact Test Method Influences Kinematic Response of Hybrid III Anthropometric Test Device'

Presented in Room 216 at 11:15 AM.

The purpose of this study was to investigate differences in accelerations of an anthropomorphic test device (ATD) head and neck (Hybrid III 50% male, Humanetics) between impacts that simulated an American football head impact (linear impactor test) and those that simulated a fall to the ground (monorail drop test) at different head impact locations and velocities. The ATD was impacted four times at 7 locations (crown, front, rear, left side, right side, left nape, and right nape) for each test and impact velocity (3.0 and 4.3 m/s). Head accelerations were determined with a 6 degree of freedom sensor package (6DX Pro, DTS) and a custom MATLAB script (Mathworks). The difference in ATD peak resultant linear (Δ PLA) and angular accelerations (Δ PAA) were calculated by subtracting the peak resultant accelerations obtained from impacts on the pneumatic linear impactor from those obtained on the monorail. Separate 2 x 7 (velocity x location) repeated measures ANOVAs for Δ PLA and Δ PAA were used to make comparisons within groups (SPSS v25, IBM). Significant differences in Δ PLA between 3.0 and 4.3 m/s impact velocities were found at the crown ($p = 0.034$), front ($p = 0.012$), rear ($p = 0.016$), right side ($p = 0.001$), and left nape ($p < 0.001$) impact locations. Significant differences in Δ PAA between 3.0 and 4.3 m/s impact velocities were found at left side ($p < 0.016$) and right nape ($p < 0.026$) impact locations. These findings indicate that differences in acceleration magnitudes between simulated American football head impacts and simulated falls to the ground may be highly specific and that the boundary conditions of the impact scenario are important for predicting head accelerations and the risk for brain injury.

Darcie Yount

Academic School: Kinesiology and Nutrition

Majoring in Kinesiology

Presentation: 'Wearing an American Football Helmet Increases Axial Loading of the Neck During Blunt Impacts'

Presented in Room 216 at 11:30 AM.

Axial loading is the primary mechanism of cervical spine injury (CSI) in American football. In 1976, rule changes prohibited head-first tackling, reducing the risk of catastrophic CSI. Similarly, in the push toward reducing brain injuries, helmet technologies have focused on reducing head kinematics during impact. The influence modern football helmets have on loading and moments at the cervical spine is unknown. Therefore, the purpose of this study was to examine the influence of a modern American football helmet on cervical spine loading as a result of direct impacts to the head. Six 2017 Schutt Air XP Pro VDT II helmets were used in this study. Helmets were fitted to a Hybrid III Male 50% head and neck anthropomorphic test device (ATD) mounted to a sliding table. The bare headform and helmets were impacted three times at eight locations at 5.5 m/s, according to National Football League helmet testing protocol. Neck loads and moments were measured with an upper neck load cell. A 2×8 repeated measures ANOVA was conducted on peak neck loads and moments. An alpha level of 0.05 was set a priori. The helmeted condition decreased anterior-posterior and medial-lateral forces, as well as flexion-extension and lateral bending moments at the neck compared to the bare head. Axial forces, however, increased with the addition of the helmet. Tensile loading was greater at locations D, A, A', B, and UT; compression forces were greater at location F. While helmets are getting better at reducing head impact kinematics, they may contribute to an increase in axial loading at the cervical spine. Thus, the effects new helmet designs as well as test methods and ATDs have on cervical spine kinetics and the risk of CSI in football should be considered.

Social and Educational Sciences and Business

Brian Bauer

Academic School: Psychology

Majoring in Clinical Psychology

Presentation: 'Nudging People Away From Suicide'

Presented in Room 214 at 11:00 AM.

A wealth of evidence from research in economics, cognitive psychology, and social psychology has indicated that people regularly make irrational decisions – decisions that are against their own self-interests. These irrational decisions often stem from humans having bounded rationality (e.g., limited computational power), which consistently elicits cognitive biases that occur outside of people's awareness and influences the decisions people make. There are many important decisions leading up to a suicide attempt (e.g., "How should I store my firearm?" "Should I ask for help?"), and it is likely that these same biases exist when making suicide-related decisions. Looking towards areas that have developed techniques to mitigate the impact of these cognitive biases in decision-making could be an important addition to suicide research and prevention efforts. Behavioral economics is one area that takes these psychological phenomena (i.e., cognitive biases) into account when trying to understand human decision-making. For example, "nudges" are behavioral economic interventions that influence people to make better decisions via bypassing, diminishing, or even leveraging cognitive biases without limiting a person's choice. Previous research by Bauer and colleagues (in press) has shown that nudges could be a time- and cost-effective intervention that can help alleviate some of the challenges currently faced in preventing suicide. The current study presents an argument for the likely existence of cognitive biases within suicide-related decision-making and how they may influence people to make irrational decisions. In addition, this manuscript provides recent results from a multi-part study (N = 800) using nudges as a way to help increase means safety, disseminate suicide prevention skills/materials, diminish well-known biases (e.g., confirmation bias), as well as uncover additional biases that may be occurring when making suicide-related decisions.



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Andrea Blake

Academic School: Education

Majoring in Higher Education

Presentation: 'Adult Children of Incarcerated Parents: Issues and Opportunities in Higher Education'
Presented in Room 214 at 9:30 AM.

The growing rate of mass incarceration in the U.S. has inevitably prompted a body of research on children and families of the incarcerated. For decades, researchers have documented the collateral consequences of parental incarceration on children and youth. With respect to their education, most studies have largely focused on threats to academic learning and development during primary and secondary education. Despite facing a negative educational outcome, scholarship on the experiences among this population that overcome these obstacles, specifically within the context of college and university campuses remains understudied. This presentation, which is part of a research project, discusses the literature on the historical lack of visibility on this population as a group seeking higher education. It will also examine the literature on student development issues and opportunities for higher education institutions, faculty, and student affairs professionals working with this college student population. In the conclusion, the author will highlight specific aspects of the topic that require further study.

Faith Brown

Academic School: Psychology

Majoring in Brain and Behavior

Presentation: 'Personality Differences in Anti-Natalism'
Presented in Room 214 at 11:15 AM.

The current study is an initial examination of personality differences in anti-natalism, the view that it is morally wrong for people to have children. People who hold this view do so for a variety of reasons: Some believe that reproduction condemns a child to the unavoidable suffering that characterizes human existence, others see reproduction as a threat to the environment or to other humans who would bear the costs of overpopulation. This view contrasts sharply with pro-natalism, the belief that people should have children, which again can be supported with a variety of reasons (e.g., humans are necessary to continue society). To assess people's moral views about reproduction, we have created a novel personality inventory assessing both general levels of anti- and pro-natalism as well as endorsement for specific moral arguments in support of each view. In addition to preliminary data validating this new personality assessment, we tested the relationships between moral views on reproduction and a variety of personality factors shown to influence either moral attitudes or individuals' approach to relationships generally. These include factors such as attachment style, one's dispositional tendency to trust and depend on close others, and belief in a just world, personality differences in the perception that moral transgressions will inevitably be punished. To our knowledge this is the first study examining anti-natalism from a psychological perspective and it has the potential to speak to the unstudied role of moral psychology in how people view reproduction.

Brian Bulla

Academic School: Psychology

Majoring in Clinical Psychology

Presentation: 'Triarchic model of psychopathy and LGB therapists: A delay discounting paradigm.'

Presented in Room 216 at 9:00 AM.

Prior literature links psychopathic traits to greater aggression towards gay men (Parrott & Zeichner, 2006; Patel et al., 1995) and being less in favor of gay rights (Preston & Anestis, 2018). Though Salekin (2002) argues for more research on the treatability of psychopathy, research is lacking in investigating psychopathy's relationship to therapist preference in general, and specifically regarding sexual orientation. We hypothesized that the Triarchic Measure of Psychopathy (TriPM; Patrick, 2010) subscales of Meanness, Boldness, and Disinhibition would significantly predict greater sacrificed therapy efficacy between an LGB and a heterosexual therapist, even when controlling for sexual prejudice and stigma. An undergraduate sample ($N=224$; age [$M=20.28$, $SD=4.72$]; 87.1% female; 83.9% heterosexual) completed the following: TriPM, Social Stigma for Receiving Psychological Help Scale (Komiya, Good, & Sherrod, 2000), Self-Stigma of Seeking Help Scale (Vogel, Wade, & Haake, 2006), Attitudes toward Lesbians and Gay Men Scale (Herek & Capitanio, 1996). Additionally, participants completed a delay discounting paradigm (modeled from Swift et al., 2015). Options were an LGB therapist with a therapeutic efficacy rate of 80%, and a heterosexual therapist where efficacy started at 10% and increased by 10 points until 80% (i.e., 8 choices). The regression model included TriPM subscales, sexual prejudice, and social- and self-stigma predicting sacrificed therapy efficacy. Boldness ($b=0.45$, $p=.021$) and sexual prejudice ($b=0.65$, $p<.001$) were the only significant predictors of sacrificed therapy efficacy. These findings illustrate the unique relationship between psychopathic traits and therapist preference with regard to sexual orientation. Implications and future directions will be discussed.

Nicole Caulfield

Academic School: Psychology

Majoring in Clinical Psychology

Presentation: 'The Association between Posttraumatic Stress Symptoms, Anxiety Sensitivity, and Suicidal Ideation in a College Sample.'

Presented in Room 216 at 9:15 AM.

Posttraumatic stress disorder (PTSD) is currently defined by the American Psychological Association (APA) as a psychiatric disorder occurring after experiencing or witnessing a traumatic event (APA, 2018). One-half of all U.S. adults will experience at least one traumatic event, and of those, approximately 11% develop PTSD symptoms (APA, 2018). Despite efficacious treatments for PTSD, one-third of people diagnosed still express symptoms after treatment (Raines et al. 2017). Thus, it is important to identify underlying factors that may be associated with PTSD symptom clusters (i.e., Avoidance, Intrusion, Negative Mood, Arousal), in order to improve treatment efficacy. One potential factor is anxiety sensitivity (AS), or "the fear of fear," and includes three different subfactors: physical, cognitive, and social concerns (Raines et al., 2017). In addition, suicidal ideation (SI) has been previously associated with heightened PTSD symptoms (Boffa et al., 2018). Thus, we felt it was important to understand how PTSD clusters related to AS subfactors and SI in a sample of college students with high exposure to trauma. Participants included a total of 65 undergraduates who all experienced a traumatic event. Multiple regression analyses were run using SPSS 25 to examine the effect of AS subfactors and SI on DSM-IV PTSD symptom clusters (IBM Corp, 2017). Results indicate the AS physical concerns were significantly associated with the Re-experiencing cluster ($\beta = .29$, $t = 2.29$, $p = .026$) and the Arousal Cluster ($\beta = .38$, $t = 2.91$, $p = .005$). The Avoidance and Numbing cluster was significantly associated suicidal ideation ($\beta = .24$, $t = 2.29$, $p = .025$) and AS cognitive concerns ($\beta = .32$, $t = 2.14$, $p = .037$). Possible implications include that computer-based AS interventions could potentially mitigate posttraumatic stress symptoms and concurrent suicide risk.

Catherine Dowell

Academic School: Psychology

Majoring in Brain and Behavior

Presentation: 'Affordances of Gibson's Feelies'

Presented in Room 216 at 9:30 AM.

This study investigated potential affordances of novel objects known as “feelies”. Unlike most objects, feelies were created specially to have no inherent or obvious capabilities or uses (i.e., affordances), making them a valuable resource to investigate the unbiased perception of affordances. Several students were presented ten feelies to explore through vision alone or touch alone (haptically) and were asked to list any possible affordances for each object. Each object was presented a total of three times through a series of three blocks, resulting in a total of 30 trials per participant. Participants were given unlimited time to explore and answer, and responses were audio recorded and later transcribed by researchers. Analyses of the responded affordances showed that visual exploration and haptic exploration yielded different patterns of responses and response frequencies. Participants in the visual condition listed more abstract and function- or goal-oriented affordances, and the pattern of commonly listed affordances was more distributed compared to responses in the haptic condition, which demonstrated a clearer pattern of frequently listed affordances. Participants in the haptic condition also listed affordances that were more action-based than those listed in the visual condition. These results show that the method of exploration (haptic or visual) can affect affordance perception of novel objects that have no known uses and possess yet to be discovered capabilities.

Lauren Lassabe

Academic School: Education

Majoring in Higher Education Administration

Presentation: 'The Birth of the Student New Right: The Loyalty Oath Provision of the National Defense Education Act of 1958'

Presented in Room 214 at 9:45 AM.

The National Defense Education Act (1958) served as the impetus for the birth of a conservative student activist movement in American higher education. Prior to 1958, conservative students were loosely affiliated within the national Intercollegiate Society of Individualists (ISI). ISI, an intellectual society with non-profit tax-exempt status, discouraged its members from political activism. Contemporary activist groups on campus such as the National Student Association (NSA) and College Republican clubs failed to capture participation of student conservatives, as their respective platforms were notably centrist and leaders decidedly progressive. Thus, anti-communist, religious, and otherwise socially conservative students in the postwar era lacked a national organization which might promote right-wing causes in American higher education. A provision in the 1958 NDEA provided a rallying point around which conservative students nationwide united. Signed during the height of the Cold War, Title II Section 1001(f) of the NDEA, commonly known as the loyalty oath provision, mandated that recipients of federal funds must swear allegiance to the United States government and refrain from subversive activity. The significance of the loyalty oath was not singularly in securing an anti-communist attitude behind NDEA grant recipients, but in uniting previously unconnected conservative students across the country toward a national goal. Participation in the cause to uphold the loyalty oath launched a movement among conservative students resulting in the most consequential activist organization for students on the political right, Young Americans for Freedom (YAF). This research provides a narrative chronology of the birth of the activist student right produced through archival data from the Hoover Institution at Stanford University and from university campuses nationwide. Archival materials include chapter documents from conservative clubs, campus and local newspapers, correspondence between chapter and national club offices, etc. Interviews with surviving student activists corroborate archival data to produce the account.



2019 Susan A. Siltanen Graduate Student Research Symposium April 11, 2019

Hannah McDonald

Academic School: Education

Majoring in Higher Education Administration

Presentation: 'Impact of Technology Overuse on Current College Students'

Presented in Room 214 at 10:00 AM.

This presentation will address the impact of technology on current college students, and more specifically, Generation Z. This is an under-studied topic given its recency, but existing research illuminates the potential negative effects of overusing social media, laptops/smartphones, and how the overuse of technology can negatively affect college students' overall well-being. Research shows that children under the age of ten are already experiencing musculoskeletal discomfort and are being seen by physicians and chiropractors as a result. Associated with the musculoskeletal discomfort and possible chronic pain are the ongoing expenses that will be required to address later issues as these children move into adulthood. This relatively new topic is one that has only gained recent attention; however, the overuse of social media and multiple devices can affect students without their understanding of how detrimental the long-term effects can be. Given Gen Z's comfort with technology with studies showing that they often view the digital world as more comfortable than the "real" world, this is an issue that will progress if not a focus of educational professionals. This presentation will present the existing research on this topic as well as identify the existing gaps and how professionals can begin to address the issue.



2019 Susan A. Siltanen Graduate Student Research Symposium April 11, 2019

Tami Monk

Academic School: Interdisciplinary Studies and Professional Development

Majoring in Human Capital Development

Presentation: 'Examining The Factors That Contribute To Employability: Do Internships Provide The Skills Necessary To Be Successful In Job Procurement?'

Presented in Room 214 at 10:30 AM.

With the constantly evolving labor market and global competition, it is essential that those preparing to enter the workforce have adequate knowledge, skills, and abilities to succeed. Over the past century, the roles of higher education institutions shifted from producing well-rounded individuals capable of functioning in society to one of producing a mass number of white-collared workers to compete and succeed in the global economy. Success in the workforce depends on several factors, one being employability. The realm of employability is substantial, ranging from field expertise to psycho-social behavior and human and social capital. The global economy functions in a knowledge-driven environment, and employees must possess the knowledge, skills, and abilities necessary to achieve the competitive advantage. This includes entering the workforce with some type of practical experience and attributes that make the person employable. The consensus among scholars is that internships benefit upcoming professionals by providing the knowledge, skills, abilities, and experience needed to succeed in a chosen career path for a student. This research examines the relationship between internships and employability. It aims to determine if internships provide the knowledge, skills, and abilities necessary for the student to be employable, thus increasing the chance for a student to succeed in the workplace.

Olivia Preston

Academic School: Psychology

Majoring in Clinical Psychology

Presentation: 'Triarchic psychopathy: Evaluating how psychopathic traits manifest in nonincarcerated adult samples and across gender'

Presented in Room 216 at 9:45 AM.

Understanding the precision of a psychopathy measure is foundational for conducting research. The triarchic model (Patrick, Fowles, & Krueger, 2009) has burgeoned in popularity within the psychopathy field. The model features phenotypical traits of boldness (social dominance, low fear and stress responsivity, venturesomeness), meanness (callousness, self-interest, unempathic disposition), and disinhibition (impulsivity, antisocial proclivities, emotion dysregulation). Psychometric investigations of the Triarchic Psychopathy Measure (TriPM; Patrick, 2010) have generally neglected to examine the extent to which its theoretical factors are substantiated in empirical work (e.g., Stanley, Wygant, & Sellbom, 2013; van Dongen et al., 2017). Recent studies suggest multidimensionality within TriPM factors (Benning et al., 2017; Shou, Sellbom, & Xu, 2018). Shou and colleagues (2018) found support for parsing boldness into factors of emotional stability and social dominance, whereas Benning and colleagues (2017) proposed a multidimensional model for meanness. Few studies utilize "data-driven", exploratory approaches, which holds advantages (Hopwood & Donnellan, 2010). In US community participants recruited via Amazon's Mechanical Turk (mTurk; N = 656), three-, four-, and five-factor solutions for the TriPM's factor structure were tested with exploratory factor analysis (EFA). EFA results were expected to show multidimensionality of Boldness and Meanness while the original three-factor structure would still achieve adequate fit with confirmatory factor analyses (CFA), which are more "theory-driven". Findings indicated Meanness items divided onto two subdimensions assessing (1) callousness and (2) antisocial behaviors, with the latter being on the same factor as the Disinhibition items. When testing five-factors, Boldness items parsed into subdimensions assessing (1) emotional stability and (2) social dominance. The original TriPM three-factor structure was compared to two revised factor structures (three-factor, four-factor) in a second mTurk sample (N=440). Both revised structures achieved better fit than the original. Implications, additional psychometric properties, and consideration of gender invariance will be discussed.

Taylor Rodriguez

Academic School: Psychology

Majoring in Clinical Psychology

Presentation: 'Racial disparities in mental health care: Considering differences in expectations and preferences for psychotherapy'

Presented in Room 216 at 10:00 AM.

Introduction: African Americans are less likely to initiate mental health care than Whites (Diala, Muntaner, Walrath, Nickerson, LaVeist, & Leaf, 2000). Literature suggests that African Americans experience mental health treatment differently than Whites (Diala et al., 2000) and have varying perspectives regarding mental health which may affect help-seeking behavior (Masuda et al., 2012; Thompson, Bazile, & Akbar, 2004). The present study explored controllable aspects of treatment (e.g., therapist characteristics, approach) that may be utilized to address gaps in mental health care.

Methods: Undergraduates (n=370; 58.6% White, 41.4% African American) completed an online questionnaire regarding expectations, preferences, and attitudes about mental health (partially adapted from Therapy Experiences Survey; Butcher, Rouse, & Perry, 1998). Mann-Whitney U and Chi-Square tests were used to examine differences between racial groups across variables.

Results: Whites reported more willingness to engage in help-seeking and more interest and experience in help-seeking, relative to African Americans. African Americans and Whites endorsed different causes of mental health problems (e.g., willpower, bad habits). Groups had differing rankings of important therapy outcomes (e.g., coping skills) and differing preferences for therapy mode (e.g., group, family). Additionally, there were different expectations of therapist characteristics (e.g., heterosexual male) and style (e.g., assertive/dominant, self-disclosing).

Discussion: While African Americans demonstrated less willingness to seek mental health care, they have distinct expectations and preferences which can inform outreach and treatment. Clients are more likely to continue treatment when their preferences are accommodated (Swift, Callahan, & Vollmer, 2011).

Sidney H. Smith III

Academic School: Social Work

Majoring in Social Work

Presentation: 'Addiction treatment outcomes and spirituality. What is the relationship?'

Presented in Room 214 at 10:45 AM.

This study examines how religiosity, specifically, church attendance, prior to admission into an addictions treatment facility (Teen Challenge) is related to the treatment outcomes of completing the program and the participants' length of stay in treatment. Additionally, the study investigates how other factors such as marital status, ethnicity, alcohol and drug use, and level of education may be related to treatment outcomes. Using archival data of 388 enrollees in a Teen Challenge program in the southern United States, the results show that religiosity prior to treatment admission is significantly related to program completion. However, the second outcome variable, length of time in treatment was not significantly related to religiosity. The findings also reveal that education was positively related to length of treatment, but not program completion. While more study is needed to understand the relationship between religiosity and addiction program completion, this study confirms a positive relationship between church attendance prior to treatment and program completion.

Tyler Surber

Academic School: Psychology

Majoring in Brain and Behavior

Presentation: 'Investigating the Processing Speed of Affordance and Semantic Primes'

Presented in Room 216 at 10:30 AM.

Gibson (1979) conjectured that perception of affordances involves detecting meaningful possibilities for action. Is the meaning obtained when an affordance is perceived qualitatively different from other types of semantic knowledge? Pilot investigations in our lab have discovered that affordance primes are processed slower than semantic features and non-associates in a linguistic semantic-categorization task that presented words on a computer screen. The slower processing of affordance primes might be due to the fact that affordances are typically encountered through our senses, and not as linguistic information. Sensory information (pictures over words) may therefore be more relevant to action. For the present study, we hypothesized that pictorial depictions of objects might be better suited for facilitating affordance-based priming than linguistic information such as reading words on a computer screen. We investigated the effects of affordance priming using a spatial categorization task. 81 object nouns were compiled from the McRae et al. (2005) norms. We used photographs of objects drawn from the database compiled as visual stimuli (Brodeur, Dionne-Dostie, Montreuil, & Lepage, 2010). Affordances denoted possibilities for action in relation to objects (e.g. sit – chair), whereas semantic features indicated definitional characteristics (e.g. has legs – chair). Participants were presented with a prime word and asked to respond by indicating whether the presented target object could fit inside of a shoebox (Bowers & Turner, 2003). Experiment 1 manipulated whether objects were presented as pictures or words. Experiment 2 only used pictures and manipulated the image quality, so that images were either presented as clear, slightly blurred, or significantly blurred. Experiment 3 presented participants with a video of blurred objects becoming clearer. Preliminary analyses support our hypotheses, specifically that affordances are processed faster than semantic features.

Poster Presentations

Life, Health, and Environmental Sciences

Kali Albright

Academic School: Kinesiology and Nutrition

Majoring in Exercise Science

Presentation: 'Pneumatic Compression Effects on Aortic Vascular Stiffness and Central Hemodynamic Load During Prolonged Sitting'

Poster #: 35

Prolonged sitting (1-6 hrs) negatively impacts the peripheral vasculature, but this affect is attenuated with frequent interruptions (e.g., walking, fidgeting). It is unknown if prolonged sitting can similarly impact markers of aortic stiffness and central hemodynamic load, and whether intermittent pneumatic leg compressions (IPC) can mitigate this response. Purpose: To test the hypothesis that sitting (3-hrs) will increase aortic stiffness and central hemodynamic load, an effect that will be attenuated with lower-leg IPC. Methods: Thirty volunteers (age=25±1 yrs, BMI=29±1 kg/m², female=10) underwent assessments of aortic pulse wave velocity (aPWV), rate pressure product (RPP), and sub-endocardial viability ratio (SEVR%) pre-post 3-hrs of sitting. In a subset (N=10), IPC (3, 120 mmHg cycles/min) was applied to legs during sitting. Results: Sitting reduced RPP (pre=7902±306 vs. post=7331±267 bpm*mmHg; p=0.002), but increased SEVR% (pre=151±5 vs. post=169±6%; p=0.002) and aPWV (pre=5.8±0.2 vs. post=6.1±0.2; p=0.04). With IPC, RPP was lower (p=0.007), SEVR higher (p=0.04), with no change in aPWV (p=0.55). Conclusions: These findings indicate that sitting does not appear to negatively affect central hemodynamics. However, IPC application may provide a more favorable response characterized by a larger reduction in central hemodynamic load, as well as an attenuation of aortic stiffening following sitting.

Ashley Chasez

Academic School: Biological, Earth, and Environmental Sciences

Majoring in Geography

Presentation: 'Unposted: Campaign Signs, Social Media, and the Digital Front Yard'

Poster #: 34

This project examines the geography of political campaign signs postings in Hattiesburg, Mississippi from 2004 to 2016. Analysis of the campaign signs posted in Hattiesburg, MS for U.S. Presidential elections in 2004, 2008, and 2016 indicates decreasing political participation in the form of campaign yard signs. This decrease appears to correlate with other forms of political participation, including voter turnout. The authors surmise that this decrease may be related to an increased use of social media for public expressions of political engagement.

Ashley Johnson

Academic School: Mathematics and Natural Sciences

Majoring in Chemistry

Presentation: 'Nature-inspired molecular sensors for the selective detection of metal ions'

Poster #: 38

The Wallace group is focused on designing metal sensors with high binding affinities for specific metal ions in both organic and aqueous systems. To do this, we utilize the HSAB theory and pay attention to metal binding motifs that are present in nature, such as siderophores. We have synthesized and characterized a library of rhodamine-based molecular sensors and monitored the optical responses of each sensor to various metal salts in a variety of solvent systems. The extent of complexation between the molecular sensor and metal ions was also studied using ESI-MS. Our studies have highlighted the crucial roles that solvent systems and counterions play in metal complex formation. By analyzing the complexation between the molecular sensors and a range of metal salts we determined that the counterion does in fact affect the coordination stoichiometry between the metal ion and the ligand, a factor that is often ignored during solution studies. We also concluded that the presence of oxygen containing solvents can disrupt the ability of the metal ions to coordinate to ligands, as the metal ions will instead coordinate to the solvent if the affinity for the ligand is less than that of the solvent. As a result we have recently designed a siderophore based optical sensor. Siderophores are small, high-affinity iron-chelating compounds that are secreted by microorganisms such as bacteria and fungi and serve as ferric and ferrous transport agents across cell membranes. By synthesizing this type of sensor, we hope to not only improve the selectivity and sensitivity of sensor towards ferric and ferrous ions but to also improve the ability of our sensor to permeate cellular membranes for use as a biosensor.

Raymond Jones

Academic School: Kinesiology and Nutrition

Majoring in Kinesiology

Presentation: 'Impact of Acute Sedentarism on Cerebrovascular Hemodynamics'

Poster #: 37

Sedentary behavior, more specifically prolonged sitting (1-6 hrs), can negatively impact lower-limb hemodynamics, characterized by a decrease in leg blood flow with concomitant impairments in vascular endothelial function. It is unclear whether sitting can similarly impact the cerebrovasculature. Purpose: To test the hypothesis that 1-hr of sitting will negatively impact cerebrovascular hemodynamics.

Methods: Fifteen participants (age= 24 ± 1 yrs, BMI= 25 ± 1 kg/m², Female=6) completed a 1-hr sitting protocol. To examine cerebrovascular hemodynamics, blood flow through the common carotid artery (CCA) was measured via Doppler-ultrasound pre-post 1-hr of sitting (supine), as well as during the sitting intervention (10- and 60-mins). In a subset (N=10), blood flow was measured in the internal carotid (ICA) and vertebral artery (VA) to estimate total brain blood flow [BBF=(ICA+VA)*2].

Results: When measured supine, CCA blood flow was comparable pre-post sitting ($p=0.38$) but decreased 10-60 mins while seated (10-mins= 990 ± 59 vs. 60-mins= 853 ± 63 mL/min; $p=0.012$). Estimated total BBF significantly decreased pre-post sitting (pre= 962 ± 101 vs. post= 753 ± 60 mL/min; $p=0.014$) but was comparable between the 10- and 60-min periods ($p=0.99$). Conclusions: These preliminary findings indicate that 1-hr of sitting appears to significantly alter cerebrovascular hemodynamics, characterized by a reduction in estimated total BBF in response to sitting in relatively healthy individuals.

Clint Henry Pablo

Academic School: Biological, Environmental, and Earth Sciences

Majoring in Microbiology

Presentation: 'Uptake and Catabolism of Plant-derived Quaternary Ammonium Compounds as a Key Adaptation to the Rhizosphere Lifestyle in *Pseudomonas synxantha* 2-79'

Poster #: 33

Pseudomonas synxantha 2-79 is a model biocontrol agent that is naturally adapted to the rhizosphere of wheat growing in semi-arid soils of the Pacific Northwest. The bacterial response to osmotic stress involves the accumulation of small organic molecules known as osmoprotectants through transport and biosynthesis. In this study, we aim to characterize the role of genes involved in the uptake of plant-derived osmoprotectants called quaternary ammonium compounds (QACs) to the adaptation of 2-79 to water stress. We analyzed the genome sequence of 2-79 and identified genes involved in the uptake and metabolism of QACs choline (CHO), glycine betaine (GB), sarcosine (SAR), and carnitine (CAR). We constructed isogenic mutants deficient in one or more transport systems and evaluated these strains for their capability to catabolize individual QACs and benefit from osmoprotection under water stress. We also used RNA-seq and ice nucleation reporter assays to measure changes in the expression of QAC metabolism genes in response to root exudates of *Brachypodium distachyon*. Our results demonstrated that root exudates perturb multiple genes associated with the uptake and metabolism of QACs. Under water-replete conditions, 2-79 catabolized CHO, GB, and SAR as sources of C and N, while under water stress, CHO, GB, and CAR are used preferentially for osmoprotection. The Cbc transporter plays the key role in the uptake of CHO under normal conditions, while under water stress the acquisition of CHO, GB, and CAR is mediated by BetT1, BetT2, and OpuC. The gene-reporter assay further supports these results by indicating that these transporter genes are upregulated under water stress. Our findings demonstrate that rhizodeposits contain osmoprotectants which help rhizobacteria adapt to water stress. This study provides insight into the function of QAC metabolism pathways in 2-79 and reflects the importance of these metabolites in the adaptation of microorganisms to the rhizosphere lifestyle.

Daphney Stanford

Academic School: Kinesiology and Nutrition

Majoring in Exercise Science

Presentation: 'Using Lower Loads Attenuates The Cardiovascular Response To Blood Flow Restricted Handgrip Exercise'

Poster #: 36

Although handgrip training combined with blood flow restriction (BFR) increases muscle size and strength, concerns exist regarding an augmentation of the cardiovascular response during exercise. Purpose: To determine the relative safety of BFR handgrip exercise by comparing cardiovascular response to low and moderate-load protocols with and without BFR. Methods: The cardiovascular response of 15 males (age=24±5 years, BMI=27.2±5.6 kg/m²) was assessed after 5 minutes of: BFR only (BFR), handgrip exercise at 40% maximal voluntary contraction (MVC) with BFR (40BFR), 60% MVC with BFR (60BFR), and 60% MVC only (60noBFR). Results: Exercise conditions increased heart rate similarly: 40BFR [4.3 bpm, (p=.011)], 60BFR [7.7 bpm, (p=.003)], 60noBFR [9.3bpm, (p=.008)]. The increase in mean arterial pressure during exercise was lower during 40BFR compared to 60BFR [-6.5 mmHg, (p<0.001)]. Augmentation index 75 was lower during 60noBFR compared to baseline [-33.25%, (p=.028)], BFR [-30.41%, (p=.003)], and 40BFR [-20.16%, (p=.012)]. The rate pressure product following exercise was lower during 40BFR compared to 60BFR [-864.14 bpm*mmHg, (p=.001)]. Tissue saturation index decreased from baseline during 40BFR [-1.45%, (p=.003)] only. Conclusion: Unilateral handgrip BFR exercise performed at a lower load may attenuate the hemodynamic response to moderate loads with and without BFR.

E. Ashley Thompson

Academic School: Biological, Environmental, and Earth Sciences

Majoring in Biology

Presentation: 'The Effects of Coinfection of ZIKV, DENV, and CHIKV with dual host insect specific flavivirus (dISFs)'

Poster #: 32

It has been shown recently that insect-specific flaviviruses (ISFs) have inhibitory and inductor activities in the presence of other arboviruses such as West Nile Virus (WNV), Chikungunya Virus (CHIKV), Zika Virus (ZIKV), and Dengue Virus (DENV). ISFs replicate in the mosquito but either do not replicate in mammalian hosts, called classical ISFs (cISFs), or can replicate in mammals but do not cause disease, called dual host ISFs (dISFs). It is theorized that dISFs either interfere or enhance virial replication of secondary infects of arboviruses depending on the secondary virus in question. In this project, mosquito larval cells (C6/36) were infected with the following dISFs: La Tina Virus (LTNV), Kampung Karu Virus (KPKV), and Long Pine Key Virus (LPKV). After three days of infection, either DENV, ZIKV, or CHIKV were then coinfecting into the C6/36 cells and allowed to grow until cytopathic effect (CPE) was observed. The cells were then collected in Trizol for qRT-PCR, and the supernatant was collected for later secondary infection. The presence of the coinfecting virus was measured and calibrated against mosquito beta-actin. Hopefully, this research will lead to a better understanding of how coinfection affects the ability of severe public health viruses such as ZIKV, DENV, and CHIKV to replicate inside the mammalian host, as well as possibly provide a platform for future vaccine research.



2019 Susan A. Siltanen Graduate Student Research Symposium
April 11, 2019

Physical Sciences and Mathematics

Garrett Abrahamsen

Academic School: Polymer Science and Engineering

Majoring in Polymer Science and Engineering

Presentation: 'Quantitative Nanomechanical Mapping Analysis of PESU-POSS Nanocomposite Blends'

Poster #: 20

Atomic force microscopy (AFM) is a technique that utilizes a nanoscale probe attached to a piezoelectrically driven cantilever with a reflective top surface to determine tip-sample interactions and obtain topographic images at the nanoscopic scale. Due to its versatility and capability, AFM has been utilized for surface analysis in numerous applications, including polymer composites, electronic devices, and biomaterials. Moreover, AFM analysis is not limited to just topographic data, but by varying the operational mode of the instrument probe information such as sample composition, surface hardness, and conductivity at the nanoscopic scale can be obtained. This study focuses on demonstrating the applicability of the quantitative nanomechanical mapping (QNM) mode, which allows the Young's modulus (E) of the sample surface or bulk to be determined at the nano- or micron-level, on analysis of thermoplastic blends of polyethersulfone (PESU) and polyhedral oligomeric silsesquioxane (POSS) nanostructured molecules. Small concentrations of POSS molecules in PESU blends have been shown to afford reductions in torque during melt extrusion and reductions in the complex viscosity. QNM analysis is used to determine the relationship of nanoscale morphology to mechanical and rheological properties.

Ilemona Atawodi

Academic School: Computing Sciences and Computer Engineering

Majoring in Computer Science

Presentation: 'A Machine Learning Approach to Network Intrusion Detection'

Poster #: 26

The evolving area of cybersecurity presents a dynamic battlefield for cyber criminals and security experts. Intrusions have now become a major concern in the cyberspace. Different methods are employed in tackling these threats, but there has been a need now more than ever to updating the traditional methods from rudimentary approaches such as manually updated blacklists and whitelists. Another method involves manually creating rules, this is usually one of the most common methods till date. A lot of similar research that involves incorporating machine learning and artificial intelligence into both host and network based intrusion systems recently. Doing this originally presented problems of low accuracy, but the growth in the area of machine learning over the last decade has led to vast improvements in machine learning algorithms and their requirements, this research applies some classical machine learning algorithms to a network based intrusion detection system in order to improve the accuracy of the intrusion detection system. This is based off an existing research with an accuracy of 76%. The goal here is to improve the feature selection process in order to increase the accuracy. With higher accuracy on smarter intrusion detection systems we can use our devices more freely without risk of intrusions and reliance on manual methods.

Ashleigh Bristol

Academic School: Polymer Science and Engineering

Majoring in Polymer Science and Engineering

Presentation: 'Aqueous RAFT Polymerization of Anionic Acrylamide-based Polymers for Determination of Non-covalent Interactions with Food-based Proteins'

Poster #: 21

Gliadin, a component of gluten and a known epitope, is implicated in celiac disease (CeD) and results in an inflammatory response in CeD patients when consumed. Acrylamide-based polymers varying in molecular weight and pendent group have been evaluated in our lab for determining non-covalent structure/binding interactions with food-based proteins in vitro. Poly(2-acrylamido-2-methylpropane sulfonate) (PolyAMPS) and poly(3-methylpropyl-3-butanate) (polyAMBA) were synthesized via aqueous reversible addition fragmentation chain transfer (aRAFT) polymerization and characterized by NMR and GPC. Anionic polymers were blended with gliadin, ovalbumin, or lysozyme and studied via intrinsic tryptophan fluorescence. The greatest level of interaction was observed with gliadin, an intermediate level with ovalbumin, and little to no interaction with lysozyme. Interactions were further evaluated via circular dichroism and zeta potential.

Beibei Chen

Academic School: Polymer Science and Engineering

Majoring in Polymer Science and Engineering

Presentation: 'Barrier Analysis of Graphene Filled Polyethylene Films: Effects of Controlled Interdiffusion on Multilayered Graphene Composite Films'

Poster #: 22

Gas barrier enhancement of linear low density polyethylene (LLDPE) / short tack graphene nanoplatelet (xGnP) composite systems has been thoroughly analyzed in bulk composites as well as coextruded multilayer films. The xGnP platelets are desirable for nanocomposite formation due to their impermeable nature, high aspect ratios, and the potential for higher particulate loadings than conventional inorganic nanofillers allow for. Through incorporation of only a small amount of xGnP in LLDPE, a substantial decrease in gas permeability was observed. To produce films with even better barrier properties that would only be expected at much higher particle loadings, the moving boundary effect was investigated in the multilayer systems consisting of alternating LLDPE/xGnP composites and pure low density polyethylene (LDPE) layers. Shrinkage of the composite layer, which was confirmed through optical microscopy, contributed to a decrease in permeability for the coextruded films that reflected the barrier properties of composites multilayers with ~3-5 wt% more xGnP loadings. Similar study was expanded to composite system based on high density polyethylene (HDPE) which has similar branching structure as LLDPE. Effect of xGnP loadings on the gas permeability of the HDPE /xGnP bulk composite was also investigated.

Zhuo He

Academic School: Computing Sciences and Computer Engineering

Majoring in Computer Science

Presentation: 'A Deep-Learning-Based Segmentation Method for Left Ventricle on Gated SPECT Myocardial Perfusion Images'

Poster #: 27

Left ventricular (LV) myocardial viability and mechanical dyssynchrony on gated SPECT myocardial perfusion imaging (MPI) are important to assess cardiac functions and make clinical decisions. However, due to the low resolution of SPECT images, it is still challenging to obtain LV myocardial mass contours with maximum perfusion, which can influence the accuracy and reproducibility of quantification of myocardial perfusion and dyssynchrony. We present a novel deep-learning-based method to automatically extract the LV myocardial mass contour with maximum perfusion from gated SPECT MPI.

The study enrolled 50 patients with coronary artery disease and each patient underwent both rest and stress 8-gated SPECT MPI. All patients were split into training set with 40 patients and testing set with 10 patients. All the labels were generated using the dynamic programming method. These labels were confirmed by well-trained operators and regarded as ground truth. A multi-label 3D V-Net was used to identify the LV mass contours with maximum perfusion on gated MPI. A new compound loss function based on both Dice score coefficient (DSC) and binary cross entropy was used for training the model, so it not only encourages similarity and penalizes the difference between prediction and ground truth, but also evaluates the quality of the predictions produced by our model. The trained model was used to extract the LV myocardial mass contours of all images in the testing set. The segmentation results of the proposed method show that the DSC is 0.95 ± 0.02 ($P < 0.001$) among the test, which demonstrates the high similarity between the prediction and ground truth. The results strongly indicate that our deep-learning-based method can accurately extract LV myocardial mass contours and has great potential for clinical use.



2019 Susan A. Siltanen Graduate Student Research Symposium April 11, 2019

Jared Hume

Academic School: Mathematics and Natural Sciences, Chemistry and Biochemistry

Majoring in Chemistry

Presentation: 'Development of a Synthetic Route for Quinoline Based Derivatives for potential treatment of HIV-1 Integrase Inhibition'

Poster #: 29

The high rate of mutation in the human immunodeficiency virus (HIV) is the primary cause of its rapid development of drug resistance. Various medications have been developed to target different stages of HIV's life cycle to hinder its natural progression to acquired immune deficiency syndrome (AIDS). The medications concerning the integration of viral DNA by HIV integrase is of major concern as only 3 FDA approved drugs on the market exist, each medication inhibiting the enzyme at the catalytic site. Due to the rapid mutagenic properties associated with this disease in the short time these medications have been on the market HIV has already begun developing resistance to these drugs. Derivatized quinolines have shown allosteric inhibitive properties allowing for new medication that doesn't require inhibiting at the catalytic site circumventing this developing resistance. Creation of a synthetic strategy to make these quinolines is ongoing in an intensive structure activity relationship (SAR) study. The focus of the study is in identifying key structural components that can be added to the quinoline backbone to increase the specificity of the quinoline to enzyme interactions which will maximize the inhibitive effects of the quinoline. Derivatization of the 4-, 6-, and 7- positions of the quinoline are achieved in late stage synthesis utilizing a palladium-catalyzed Suzuki coupling reaction which is the primary focus of this research.

Dil Limbu

Academic School: Mathematics and Natural Sciences

Majoring in Computational Science (Physics)

Presentation: 'Structural modeling of amorphous silicon via effective inversion of scattering data: A reverse Monte Carlo (RMC) approach'

Poster #: 30

We present an efficient reverse Monte Carlo (RMC) simulation of amorphous silicon using a cost function comprising experimental pair-correlation data and the geometrical properties of local tetrahedral bonding arrangement of silicon atoms in the amorphous state. While earlier studies of RMC simulations struggled to produce satisfactory results, the present study shows a significant improvement of the RMC-derived structural models as far as the dangling-bond (3-fold coordinated atoms) density, the bond-angle distribution and its width, and the presence of a gap in the density of electronic states are concerned. By using appropriate optimization parameters, we have demonstrated that it is possible to improve significantly the structural quality of existing RMC models of amorphous silicon in the literature without employing any total-energy functional via inversion of experimental diffraction data, assisted by few higher-order correlation functions. A direct comparison of structural, electronic, vibrational and thermodynamic properties of the models with those obtained from the Wooten-Winer-Weaire (WWW) method and the recent high-quality molecular-dynamics simulations is also presented. The RMC models obtained in this study show a maximum coordination-defect density of up to 4% and a narrow bond-angle distribution, which is characterized by a root-mean-square width of about 11 degrees, as observed in Raman measurements. The static structure factor of the models is also found to match closely with the experimental diffraction data.

Kyle Mehringer

Academic School: Polymer Science and Engineering

Majoring in Polymer Science and Engineering

Presentation: 'Polyisobutylene Containing Covalently Bound Anti-oxidant Moieties'

Poster #: 23

Polyisobutylene (PIB) is of industrial importance due to its inherently high gas barrier properties. Although more resistant to thermo-oxidative degradation than most polyolefins, its useful lifetime can be extended by incorporation of antioxidants. Simple blending of small molecule antioxidants with the polymer may improve performance; however undesirable leaching of the additive may result. Covalent attachment of the antioxidant provides an attractive alternative. The Storey research group previously demonstrated the covalent attachment of an antioxidant, 2,6-di-tert-butyl phenol (DTP), via Lewis-acid catalyzed cleavage/alkylation of poly(isobutylene-co-isoprene) (butyl rubber) in the presence of DTP. However, the process has only been carried out at small scale and has not been optimized with regard to product molecular weight, efficiency of DTP incorporation, and several other factors. The goal of this research is to optimize the process at larger scale, including the exploration of new polymer purification methodologies.

Johnson Oguntuase

Academic School: Ocean Science and Technology

Majoring in Marine Sciences

Presentation: 'A Performance Evaluation of Multiple GNSS-aided Inertial Navigation Systems'

Poster #: 25

The needs to acquire accurate, reliable, and usable bathymetric and LIDAR dataset in a timely and cost-effective manner are driving the surge in the emergence of acquisition platforms and solutions. For every manned or unmanned hydrographic survey platforms, a navigation and orientation system is required. Most of the current survey grade positioning systems integrate Global Navigation Satellite Systems (GNSS) and Inertial Navigation System (INS).

Many systems are available with different operating principles, hardware, sizes, and precisions. Given the different accuracy specifications and the performances at different sea-state, the costs for different product vary. This allows for a wide spectrum of cost-effective choices. However, the performances of these GNSS-aided INS by different manufacturers, subjected to the same field test is rarely known. In our study, a common dataset was collected simultaneously utilizing eight different positioning systems in August 2018. In this paper, we compare the processing strategies of the native software that underpins the trajectory solution in real-time and post-mission. We also analyze the behavior of these systems under GNSS-restricted environment, particularly during passes under a bridge. Finally, we investigate the respective improvements of the post-mission over the real-time solutions.

Durga Paudel

Academic School: Mathematics and Natural Sciences

Majoring in Computational Science (Physics)

Presentation: 'Temperature-induced morphological evolution of voids in amorphous silicon: A first principles study'

Poster #: 31

We present the morphological characteristics of voids in amorphous silicon with particular emphasis on the dynamics of hydrogen atoms inside the voids. Since voids are extended-state inhomogeneities, on the length scale of a few nanometers, it is necessary to simulate ultra-large models of amorphous silicon in order to study realistic distributions of voids in amorphous silicon, which are in compliant with the experimental data from small-angle x-ray scattering, infrared spectroscopy, and nuclear magnetic resonance experiments. Here, we discuss the production of such ultra-large models of amorphous silicon from classical simulations and subsequent study of the morphological evolution of voids upon annealing at room and high temperature (800 K). The dynamics of H atoms inside the voids were studied and the role of SiH, SiH₂ and molecular hydrogen in the reconstruction of the void surface were examined and discussed. Our results suggest that the concentration of molecular hydrogen inside the voids, upon annealing from 300 K to 800 K (below crystallization temperature), decreases by about 4.5%, causing considerable changes in the shape and size of voids of the voids. A comparison of our results with those from experimental nuclear magnetic resonance, infrared and calorimetric measurements is also discussed here.

Sarbagya Shakya

Academic School: Computing Sciences and Computer Engineering

Majoring in Computer Science

Presentation: 'Video-based Human Action and Activity Recognition for Elderly Health Care Application'

Poster #: 28

Elderly health care monitoring systems have been in demand for observing and tracking the health status of aged people. With the application of video-based research in different fields of computer vision, video surveillance and smart home systems, human activity recognition (HAR) have been a reasonable approach for monitoring the peculiar behavior of the elderly, people with poor health, and people suffering from mental disorders. with the recent development in the 3D camera and increase in the use of a camera for surveillance, the vision-based activity recognition has been a popular approach in HAR. In this paper, a deep learning model and architecture are implemented on different video-based datasets that are extracted from RGB-D sensors to recognize daily activities related to elderly people. We trained the convolutional neural network (CNN) based model with the sequence of frames extracted from the training video data, validated it with the validation data, and then tested the model with the testing data. The output showed a comparable result with some other state-of-art performance in a similar dataset.



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Jeremy Weigand

Academic School: Polymer Science and Engineering

Majoring in Polymer Science and Engineering

Presentation: 'Molecular Dynamics Simulation and Experimental Study of Thermoset Acrylate Networks Prepared via Stereolithography'

Poster #: 24

3D printing has emerged as a powerful manufacturing technique for the rapid production of highly complex parts. Stereolithography (SLA) is a 3D printing approach which selectively exposes liquid resin to a rastering UV laser to build parts in a layer-by-layer approach. While SLA and AM offer manufacturing advantages, the continued application of SLA in a variety of research fields necessitates the continued development of new materials for this innovative process. Our methods utilize experimentation paired with Molecular Dynamics (MD) simulations to study the photo initiated free radical polymerization of an acrylate during SLA 3D printing. After simulated crosslinking, network properties including crosslink density and glass transition temperature are calculated. Simulation results are found to be in good agreement with results determined experimentally. The methods presented in this work provide new insights into the use of MD simulations for the study and design of new 3D printing materials.



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Social and Educational Sciences and Business/Arts and Humanities

Grace Andrews

Academic School: Library and Information Science

Majoring in Library and Information Science

Presentation: 'Navigating Theological Resources: A Webometric Content Analysis'

Poster #: 7

In the current information environment, a library's website is usually the first point of access for patrons. Therefore, website design is crucial for designing a user-friendly library. However, it can be difficult, given the range of possibilities, for a library to know how to organize and label key components when revitalizing its current website or creating a website from scratch.

Libraries use their websites to provide information about themselves and to promote their services. With the increasing amount of digital information, a library's website often functions as a portal and not just a sign. The sheer amount of information a library has to organize on its website makes design difficult. Questions arise concerning the location and labeling of library contact information, operating hours, various services, policies, metadata about resources, and sometimes access to the resources themselves. Through webometric content analysis, this study seeks to determine how such content is organized on theological library websites, presenting a pattern of labeling and navigation for libraries to consider and perhaps follow. This is accomplished by carefully and systematically examining a selection of theological library websites to trace the ease of navigation to the library homepage, the online catalog, online databases, and other important content in terms of number of clicks and labeling of hyperlinks.

Through this study's collection and analysis of trends in theological library website design, it may encourage more specific standards of the navigability of theological library websites. Although this study does not necessarily indicate what works best for users, it documents the relative ease and method of navigation across various theological library websites, giving libraries a place to start in website design. The project's findings and recommendations may be of interest to librarians, IT staff, and administrators at theological institutions, as well as faculty and students at these institutions.

Nazanin Bani Amerian

Academic School: Communication

Majoring in Communication

Presentation: 'What is behind the decision of Evacuating in Hurricanes?'

Poster #: 1

Objective of this study was to identify theories to examine the complex intercultural conflict between immigrants and people of host countries. This article explores a case study through the lens of conflict communication that we think perhaps extend the focus of research, based on the relationships between incoming refugees and host culture citizens. We use Culture-Based Social Ecological Conflict Model to describe the intercultural conflict happening within the society after major immigrations. Study is focused on Syrian Immigrants in European countries aiming to understand these conflicts in scarcity of resources, ethnic assumptions, and cultural differences. Primary factors, Situational Appraisals, Conflict Processes and Conflict Competence is analyzed in Social Identity Theory, Facework, Culture-Based Social Ecological Conflict Model.

Karen Boger

Academic School: Communication

Majoring in Communication

Presentation: 'The Wakefield Phenomenon: A Rhetorical Examination of the Resurgence of the Anti-Vaccination Movement in the 20th & 21st Century'

Poster #: 2

This paper explores the unique communication phenomenon of anti-vaccination movement rhetoric and existing publications documenting significant points in its resurgence in the late 20th and early 21st century following the now redacted publication by the former Dr. Wakefield asserting a correlation between children receiving vaccinations and children exhibiting the onset of developmental disorders, with Autism Spectrum Disorder (ASD) garnering the most public attention. With increasing numbers of parents delaying or forbidding their children from receiving vaccinations, along with the re-emergence of previously eradicated disease outbreaks and casualties, questions about the salience of Wakefield's anti-vaccination statements arise. Investigation here is key to understanding how the general public decides whether or not to adhere to this conspiratorial form of argumentation which claims the healthcare system intends to create illnesses/disabilities only to sell consumers treatment. This proposed study intends to analyze the 1998 Wakefield publication "Ileal-lymphoid-nodular hyperplasia, non-specific colitis, and pervasive developmental disorder in children," Autism Speaks' 2007-2015 "Learn the Signs/World of Autism" campaign, and Wakefield's 2016 documentary "Vaxxed: From Cover-Up to Catastrophe" through synecdoche in disability rhetoric, apologia in health rhetoric, and counterpublics in social movement rhetoric to identify the methods of persuasion and argumentation that may have contributed to the trends and resurgence of the anti-vaccination movement.

Lauren Burns

Academic School: Psychology

Majoring in Clinical Psychology

Presentation: 'Personality, Psychopathology, and Substance Use: An Analysis of At-Risk Youth Profiles'

Poster #: 8

The co-occurrence of substance use and psychopathology has been well cited throughout research. For example, engaging in excessive alcohol consumption or displaying drug use-related impairment before the age of 18 has been shown to increase the risk of antisocial behaviors in adulthood (Ridenour et al., 2002). Similarly, adolescent substance use is associated with increased risk for aggressive behavior (Doran, 2012). Many nuances of this relationship remain unexplored. The purpose of this study was to expand on such findings by exploring how marijuana and alcohol use relate to personality and psychopathology, as measured by the Personality Assessment Inventory-Adolescent (PAI-A; Morey, 2007), in at-risk adolescents. It was hypothesized that participants classified as frequent alcohol or marijuana users would exhibit relative elevations on a number of conceptually-relevant PAI-A scales. A sample of 188 adolescents (79% Males, 21% Females) at a military-style residential program for at-risk youths completed the Youth Risk Behavior Surveillance Survey (CDC, 2015), which posed questions about their substance use history, including degree of use and perceived consequences of use, and the PAI-A. Results from multiple one-way ANOVAs were largely consistent with the literature and proposed hypothesis. Specifically, youths in both the heavier alcohol and heavier marijuana-using groups demonstrated significantly higher scores, relative to youths with lighter substance use histories, on multiple PAI-A scales. The results of this study help further elucidate the co-occurrence of substance use and psychopathology among adolescents, which could inform prevention and intervention efforts.

Jinhao Chi

Academic School: Psychology

Majoring in Psychology

Presentation: 'European American's Cognitive Emotional and Behavioral Responses to Police Shooting, Slavery and Non-racial Injustices'

Poster #: 9

We compared White participants' cognitive evaluation of and emotional responses to non-racial (e.g., gulf oil spill) and racial events (slavery & police shooting of unarmed Black men) and their willingness to donate to charities fighting against these injustices. They were emotionally affected by racial injustices, and especially so by slavery, but not much so by police shooting. Yet, more donations were intended for non-racial charities than racial charities. The race of the experimenter did not have any effect on participants' responses.



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Arien Faucett

Academic School: Kinesiology and Nutrition

Majoring in Kinesiology

Presentation: 'A Discourse Analysis of Articles on the Baylor University Assault Scandal'

Poster #: 18

Between 2011 and 2016 numerous sexual and non-sexual assaults were alleged against Baylor University football players. The NCAA and the university launched probes into the head coach at the time, Art Briles, and various administrators at the university for their potential roles in the situation. Ultimately, Briles was fired and several Baylor University administrators resigned. In an effort to understand the conversation surrounding this scandal a discourse analysis was conducted on a sample of popular press articles. Six artifacts were found using the search terms "Art Briles + Baylor University" in a search engine. Articles were intentionally selected from news outlets specific to the Baylor University geographical region, as well as national news outlets. Several themes emerged from the analysis. Each article gave voice to those who were in a position of authority at the university. These individuals include members of the Board of Regents, former Baylor University head football coach Art Briles, former Baylor University president Ken Starr, as well as several attorneys representing these individuals/entities. However, no voice was given to the victims of these acts. The power resided solely with those men who were already in powerful positions within the university setting. While the 17 women who alleged sexual or domestic assault against 19 Baylor football players were mentioned, the authors of the articles as well as the individuals quoted within the articles did not focus their attention on the women. Rather, the articles were positioned to paint either Art Briles as the scapegoat for Baylor University administration or as a knowledgeable participant who held loose disciplinary standards. The text analyzed failed to give a voice to the true victims of the abuse. This analysis sheds light on the power dynamics present in the accounts of the Baylor University sexual assault scandal.

Sean Fourney

Academic School: Communication

Majoring in Communication

Presentation: 'The Collaborative Situation: Exploring a University System Through Risk Definition'

Poster #: 3

Given the nature of differing risks that can damage higher education systems, communication between campus officials and stakeholders is paramount in maintaining organizational sustainability. This case study investigated how a university defines and responds to risk. Thirty one-on-one interviews with campus leaders sought to identify how a system collectively communicates elements of risk within and beyond its environment while forming relationships in attempts to mitigate it. Additionally, inquiry into who departmental leaders view as stakeholders informed not only the adjustment of system purposes but also shed light on the area of boundary spanning in communicating cultural and political uncertainty for higher education.

Matthew Gretz

Academic School: Psychology

Majoring in Brain & Behavior

Presentation: 'Multiple Species of Distinctiveness in Memory: Separating Task Distinctiveness from Statistical Distinctiveness'

Poster #: 10

Distinctiveness refers to the memory benefit of processing unique or item-specific features of a memory set relative to non-distinctive controls. Distinctiveness effects are typically attributed to qualitative differences in how distinctive items are processed at study. The current study seeks to evaluate whether a separate species of distinctiveness, statistical distinctiveness, may operate as a separate source of distinctiveness in memory. Statistical distinctiveness refers to the relative scarcity with which the processing of memory items occurs, in which items that receive rare processing are better remembered. The current study used a series of mixed groups to evaluate statistical distinctiveness, in which word lists were studied using different frequency combinations of study tasks. These tasks consisted of either shallow "E" judgments, a neutral read task, or deep pleasantness rating task. Mixed-group participants in the mixed group studied lists in which these tasks were used frequently (80% of lists), equally distributed (50% of lists), or infrequently (20% of lists), followed by a recognition test to measure memory performance. Mixed lists were then compared to pure groups in which a single task was used to study all word lists to further gauge statistical distinctiveness. Pure-group recognition was greatest for deep pleasantness ratings followed by the read task and then "E" task—a standard level-of-processing effect. Mixed-group recognition showed evidence for statistical distinctiveness, but only in the read/"E" task mixed group when the read task was completed infrequently (20% of the study items). All other combinations showed no effects of statistical distinctiveness. Evidence for statistical distinctiveness therefore only occurred when mixed tasks consisted of shallow study tasks.

Hallie Jordan

Academic School: Psychology

Majoring in Counseling Psychology

Presentation: 'Posttraumatic Stress and Marijuana Outcomes: The Mediating Role of Marijuana Protective Behavioral Strategies'

Poster #: 11

Marijuana is the most commonly used illegal substance on college campuses (SAMHSA, 2015). In fact, college student marijuana use is on the rise, with 38% of students reporting use in the past year and 21% reporting use in the past month (Schulenberg et al., 2018). These rates of use are particularly concerning because increased marijuana use is related to negative marijuana-related consequences (Buckner, Ecker, & Cohen, 2010) and escalates one's risk for developing a cannabis use disorder (CUD; Looby & Earleywine, 2007). The present study investigated the mediating role of protective behavioral strategies for marijuana (PBSM) on the relationship between posttraumatic stress disorder (PTSD) and marijuana outcomes (i.e. marijuana use frequency, marijuana use quantity, CUD symptoms, and negative marijuana-related consequences). Participants were 1,107 traditional age students (Mage = 20.26, SD = 3.32; 66.5% White, non-Hispanic; 68.8% female) recruited to complete an online survey via Psychology Department Participant Pools at ten universities across ten U.S. states (Bravo, Villarosa-Hurlocker, & Pearson, 2018). All participants reported consuming marijuana at least once in the last 30 days and completed measures of PTSD symptoms, PBSM, and marijuana-related outcomes. PBSM significantly mediated the relationships PTSD symptoms had with each marijuana-related outcome. More specifically, PBSM significantly predicted marijuana use quantity, which in turn significantly predicted marijuana-related problems and CUD symptoms. Thus, the association between higher PTSD symptoms and greater experience of marijuana-related problems and CUD symptoms appears to be explained by using fewer PBSM and thus engaging in larger quantity and frequency of marijuana use. These findings lend support to the utility of integrating PBSM as a harm reduction effort for students with PTSD who use marijuana.

Kristy Larsen

Academic School: Psychology

Majoring in Clinical Psychology

Presentation: 'Organized Chaos: Daily Routines Link Household Chaos and Child Behavior Problems'

Poster #: 12

The aim of this study was to examine daily routines as a potential mediator of the relation between household chaos and both child externalizing behavior and bedtime resistant behavior. Studies show that children living in chaotic households exhibit more externalizing behaviors, which when exhibited as early as the toddler and preschool years, are a risk factor for later maladjustment. Understanding the mechanisms linking household chaos to early externalizing behaviors is important since those mechanisms could be targeted as a point of intervention. Using Amazon's Mechanical Turk (Mturk), parents ($n=120$) of a child age 2-5 completed questionnaires online assessing household chaos, frequency of routines, and child behavior problems. Results supported an indirect effect of household chaos to child behavior problems through family routines and general child routines (independently) and an indirect effect of household chaos to bedtime resistant behavior through children's bedtime routines. These findings suggest that household chaos and routines are distinctive constructs and that routines are a mechanism linking household chaos to early child behavior problems. Clinically, these results imply that routines may be a reasonable focus for intervention among families living in chaotic households who have young children exhibiting behavior problems.

Casey LeJeune

Academic School: Social Science and Global Studies

Majoring in Anthropology

Presentation: 'An Attempt to Determine the Sex of Juveniles Using Mandibular Morphology'

Poster #: 5

A significant portion of the bioarchaeological record is comprised of juvenile remains, making the information they provide extremely valuable in studying past populations. Sex estimation is a crucial demographic component of any population, but reliable methods have yet to be established for juvenile remains. The best results thus far have come from analyzing morphological characteristics of mandibles and ilia. In this study, my approach was to compile mandibular features to examine, with a particular focus on those features that have shown the most dimorphism in other studies. I examined the remains of 19 juveniles from the Tipu Maya skeletal collection (MNI ~600) housed at The University of Southern Mississippi. The estimated ages for these individuals ranged from 3-13 years old. Each individual was selected for overall mandibular preservation, and the mandibles were scored on a 1-5 scale, 1 being most likely female and 5 being most likely male, for each of 7 traits. The traits of symphyseal base shape, chin protrusion, and mentum shape involved the chin. Two traits, the gonion and the mandibular angle, involved the ramus. Body shape was scored for the overall shape of the inferior edge of the jaw, and anterior dental arcade was analyzed for how wide or restricted of an angle it followed. After individually scoring each trait, I made an overall assessment of sex based on a compilation of those scores. Ultimately, 47.37% (9) of the individuals were given a sex determination of female, and of those remaining 31.58% (6) were scored male and 21.05% (4) were designated as indeterminate. In light of the proportion of these determinations, this study does not seem to substantiate the idea that mandibular features are significantly sexually dimorphic in juvenile remains.

Nicholas Maxwell

Academic School: Psychology

Majoring in Brain & Behavior

Presentation: 'Relations are not always beneficial: The effect of associative direction on judgments of learning'

Poster #: 14

Examining the relationship between one's predicted versus actual memory performance is the primary goal of metamemory researchers. A common method for examining this relationship is instructing participants to provide judgments of learning (JOLs) in which participants rate the probability that they will be able to later recall a target word from a studied cue-target pair (e.g., bank-interest) when only a cue word is provided at test (e.g., bank-_____). Previous research (e.g., Koriat & Bjork, 2005) has shown that the accuracy of JOLs is sensitive to the associative strength and direction of the cue-target pair. The standard pattern is that JOLs and recall accuracy is well calibrated for forward-associative pairs (e.g., credit-card), but JOLs produce an illusion of competence for backward-associative pairs (e.g., card-credit) in which predicted JOLs are greater than recall accuracy. The present study novelly examines the correspondence between JOLs and recall accuracy using a third pair type: Symmetrical associates (e.g., on-off). Participants provided JOL ratings for studied word pairs followed by a cued-recall test for forward, backward, symmetrical, and unrelated study pairs (cat-building). JOLs and recall accuracy were well calibrated for forward pairs, but participants showed large overpredictions of JOLs for all other pair types, particularly for backward associates. Calibration plots, in which JOLs ratings were graphed against their corresponding recall accuracy, showed that JOL overpredictions occurred for backward and unrelated pairs across recall rates, but only occurred for forward and symmetrical pairs when recall rates were high (60-100%). These analyses therefore show association strength and direction affect illusions of competence and that this illusion depends upon the relative recall rate.

Rita Nassuna

Academic School: Communication

Majoring in Communication

Presentation: 'The Role of Women in the Rwandan Genocide'

Poster #: 4

Culture has always dictated how women are supposed to behave in Rwanda. Between 1962 and 1994, during the Rwandan genocide, women held limited social and political roles in the traditionally patriarchal society (Doan, 2010). The women's active participation during and after the genocide shows how their participation accomplished two things - rebuilding the country and dispelling the myth of women being wall flowers.

Kathleen Ramsey

Academic School: Psychology

Majoring in Clinical Psychology

Presentation: 'Elevated ADHD Symptomatology and Poor Anger Control as Predictors of Aggression Among Male Juvenile Offenders'

Poster #: 15

Youth with ADHD are disproportionately at-risk for engaging in criminality (Sibley et al., 2011) and aggression (Becker et al., 2012) relative to the general population, and this may be a function of underlying executive function deficits associated with self-regulation (Davidson, Putnam, & Larson, 2000). More specifically, youth with ADHD may be susceptible to difficulties with behavioral regulation (i.e., impulsivity) and emotional regulation (e.g., managing the experience of anger; Harty et al., 2009). The current study sought to expand on previous research to examine the relationship between ADHD symptomatology, emotion regulation, and institutional aggression of institutionalized youth. Archival data comprising a sample (N=119) of male adolescents (Mean age = 16.74; 30% white, 70% black) who were admitted to a maximum-security residential facility were analyzed for the purposes of this study. Youths completed measures assessing ADHD symptoms, trait anger, and anger control upon admission. Additionally, access to behavioral write-ups given by staff for youths committing rule violations within the facility was obtained. Results revealed that those youths with elevated ADHD symptomatology and higher trait anger scores were more likely to commit rule violations while initially adjusting to the facility. Surprisingly, those with higher self-reported anger control scores were more likely to engage in physical aggression and threatening behaviors. These results may suggest that those youths with less behavioral control and a chronic tendency to feel anger frequently are more prone to engaging in a variety of rule-violating behaviors (e.g., disruptive behaviors, noncompliance). Those youths with more control over their anger may be less susceptible to acting out impulsively and more intentional in physically aggressive and threatening behaviors. Alternatively, they may have attempted to present themselves in a favorable light or have poor insight into their ability to control anger.

Courtney Robinson

Academic School: Education

Majoring in Higher Education Administration

Presentation: ‘An Analysis of Viability and Functionality: How Enrollment Management Personnel and Former Students Perceive the Proposed Implementation of an Artificial Intelligence-Based Chatbot Focused on Student Financial Communication’

Poster #: 6

A competitive higher educational environment forces colleges and universities to focus on increasing both student recruitment and retention, challenges that coincide with declining state and federal funding, leaving many institutions struggling to balance higher expectations and declining resources. Oftentimes, institutions implement a plethora of technological platforms that help streamline the workload. One example gaining traction are artificial intelligence-based chatbots, which have been implemented at many institutions to automate processes and facilitate communication.

Like other institutions, The University of Southern Mississippi is not immune to funding decreases and challenges regarding student retention, however, the institution’s current communication strategy often relies on mass communications rather than targeted strategic interactions. This creates a reactive – rather than proactive – dialogue with students, and delays the flow of information. When contacting the university, students are often transferred to several departments, which has become unofficially known as the “Southern Miss Shuffle.” This research surveyed current staff and former students to see if a chatbot could decrease attrition and improve communication. Specifically, the purpose of this research was to evaluate the perceptions of implementing a chatbot that provides financial aid information to students in real-time. With a population comprised of many lower socioeconomic and first-generation college students, research linking access to financial information to persistence is critical.

Surveys were distributed to USM students who left the institution during the 2016-2017 academic year without graduating. The surveys sought feedback on the how communication regarding finances impacted the student’s decision to leave the institution, while also soliciting feedback on a chatbot prototype. A similar survey was distributed to employees of the Office of Admissions, Office of Financial Aid, Business Services, and the New Student and Retention Programs office, to evaluate their perspectives in the same areas, while also seeking feedback on communication improvement in these departments.



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Marla Rosenvall

Academic School: Child and Family Sciences

Majoring in Marriage and Family Therapy

Presentation: 'Imposter Syndrome, Burnout and Compassion Fatigue Amount Mental Professional'

Poster #: 19

Imposter syndrome, described as occurring when “high-achieving individuals attribute their successes to external factors and are unable to internalize success”(Peteet, Montgomery & Weekes, 2015), has been noted in a variety of occupations and populations, including medical students (Qureshi et al., 2017), marketing managers (Fried-Buchalter, 1992), nursing students (Christensen et al., 2016), and minority college students (Peteet, Montgomery & Weekes, 2015). However, no studies were found that targeted workers in the mental health profession, a population that research suggests also struggles with burnout (O'Connor, Neff, & Pitman, 2018) and compassion fatigue (Turgoose & Maddox, 2017). The current study surveyed 115 mental health professionals to determine whether they experience imposter syndrome and, if so, the relationship between imposter syndrome and both burnout and compassion fatigue. Data analysis indicates the presence of imposter syndrome was positively associated with compassion fatigue and negatively associated with compassion satisfaction. In addition, a negative association was found between years of work as a mental health professional and both imposter syndrome and burnout. Analysis of the interaction of age and years of work predicted that individuals who have higher levels of imposter syndrome would be newer in the field and would have higher levels of burnout.

Kray Scully

Academic School: Psychology

Majoring in Counseling Psychology

Presentation: 'The Mediating Effects of Drinking Refusal Self-Efficacy on the Associations Between Alcohol Protective Behavioral Strategies and Alcohol Use Outcomes'

Poster #: 16

Alcohol use continues to pose a serious, widespread public health problem at universities nationwide, largely due to the extent of consumption and frequency of negative consequences experienced among college students. Alcohol protective behavioral strategies (PBS-A) are an empirically supported repertoire of safe drinking behaviors college students can use to monitor and control their alcohol consumption as well as limit harm while drinking. However, there remains a need to better understand how cognitive mechanisms, such as drinking refusal self-efficacy (DRSE), help explain college student safe alcohol use behaviors to enhance evidenced-based intervention and prevention efforts. Recently, studies that examined the moderating effect of DRSE on the associations among PBS-A and alcohol use outcomes demonstrated contradictory results, suggesting that DRSE may not account for the strength of these relationships. Therefore, the goal of the present study was to evaluate the mediating effects of DRSE and its dimensions (i.e., social pressure DRSE, emotional relief DRSE, opportunistic relief DRSE) in the associations among PBS-A and its subtypes with alcohol use outcomes. A national sample of 380 traditional age ($M = 22.50$; $SD = 1.82$) college students (51% male; 68% White) who reported consuming alcohol within 30 days of study participation completed an on-line survey about their safe and harmful alcohol use behaviors. Using path analysis, DRSE partially mediated all associations among PBS-A and all outcomes. Moreover, social pressure DRSE fully mediated the association between PBS-A and negative consequences while opportunistic relief DRSE mediated relationships between PBS-A and all three outcomes. Finally, all subtypes of DRSE fully mediated the relationship between serious harm reduction PBS-A and negative consequences. These results suggest that DRSE may be an important cognitive variable when evaluating PBS-A use and their relationships with alcohol use outcomes among college students. Study implications and limitations will be discussed.

Kendal Smith

Academic School: Psychology

Majoring in Brian & Behavior

Presentation: 'Item-Specific Processing Reduces Mediated False Recognition by Reducing Spreading Activation and Increase Test-Based Monitoring'

Poster #: 17

In the Deese/Roediger-McDermott (DRM) paradigm, participants study lists of related associates (e.g., bed, rest, tired, etc.) that all directly converge upon a single, non-presented critical lure (e.g., sleep). At test, false recognition of the critical lure often exceeds correct recognition rates of studied list items (Roediger & McDermott, 1995). The DRM false memory illusion has been reduced through item-specific encoding, in which participants focus on the distinctive/unique aspects of associates at study, relative to a read-only control task and relational processing, in which participants focus on shared details of the study lists (Huff & Bodner, 2013). In the present experiment, I examined whether the previous encoding patterns would similarly occur on mediated lists in which participants study lists of words (e.g., tub, meteor, hinge, etc.) that are indirectly related to a critical lure (e.g., clean), through a list of DRM associates that are not studied (e.g., bath, shower, squeak, etc.). Participants studied mediated lists using either item-specific, relational, or read-control tasks followed by an old/new recognition test containing mediated critical lures. Item-specific and relational encoding were found to increase correct recognition relative to the read control, but only item-specific encoding decreased false recognition of mediated critical lures. Signal-detection estimates revealed that the item-specific reduction in false recognition was due to a reduction in implicit spreading activation of the critical lure at study and an increase in memory monitoring at test operating in tandem. My results highlight the benefits of item-specific encoding at enhancing memory accuracy, even when lures are indirectly related.

Benjamin Wright

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Majoring in Counseling Psychology

Presentation: 'Social Class and Career Decision-Making: A Structural Equation Model'

Poster #: 13

Research in Counseling Psychology has largely neglected to explicitly evaluate the influence of social class on career development. Work-related theories such as the Social Cognitive Career Theory (SCCT), Social Class Worldview Model, and Psychology of Working Theory, do provide room for the incorporation of social class variables into research on career development and career counseling. The objective of this project was to understand the influence of social class on key career decision-making variables identified in SCCT. Another objective was to understand how grit, the ability to persist despite barriers, may influence the relationship between social class and career decision-making. Our sample consisted of 226 undergraduate college students at the University of Southern Mississippi (USM) recruited through the School of Psychology SONA research participation system. A structural equation model was used to evaluate the predictive power of social class on career decision-making outcomes. A moderation analysis was also included to evaluate if grit influenced the degree to which social class impacts career decision-making. Results indicate that social class did not significantly influence the career decision-making of our sample. However, grit did successfully moderate the relationship between social class and career decision-making. The overall model accounted for 21.8% of the variance in career decision-making. This project indicates that social class may be an influencing factor on career decision-making when accompanied by differences in college students' grit. Methodological inconsistencies in the field of vocational psychology for measuring social class may have limited the ability to identify any significant direct influences of social class on career decision-making. Next steps include the refinement of social class measurement and the expansion of social class research beyond the college student population.