

30th Annual Student Research Forum



Poster Presentation

Monday Mar. 26 | 10-11:30 AM

University of Memphis
University Center Ballroom (Room 320)

Hosted by the Graduate School and the Honors College.
For more information: memphis.edu/srf.

UNDERGRADUATE ABSTRACTS

EDUCATION

An Investigation of the Most Prevalent Disabilities in U.S. Classrooms and Effective EBP Instructional Strategies

Meghan Himstead, (Instruction and Curriculum Leadership)

In the 2014-2015 school year, 6.6 million children in the U.S. were receiving Special Education services, accounting for 13% of public school students. As such, it is the responsibility of educators to have a firm understanding of disabilities, how disabilities affect academic progress, and utilize effective evidence-based instructional strategies in practice to serve this population of students. The following research study illuminates the five most prevalent disabilities that affect students in the classroom in the U.S., provides identifying characteristics and definitions, and disseminates the most effective evidence-based instructional strategies for practitioners. The benefits, implications, and limitations will be discussed.

ENGINEERING

An in vitro investigation of chitosan thermo-gels for local antibiotic delivery

Samer Abdulahi, (Biomedical Engineering)

Chitosan sponges and pastes have been found to be effective local drug delivery vehicles as they can elute antibiotics and biodegrade. The objective of this study is to develop thermally induced chitosan paste modifications to offer predictable local antibiotic delivery to the site of infection. Chitosan sponges were made by lyophilizing chitosan, beta glycerophosphate (BGP), and 0.85% acetic acid solution. The solutions were made with different amounts of chitosan (2% and 3%) and BGP (10% and 15%) with some being pre-heated. Daily elution analysis showed that lower percentages of chitosan resulted in less burst and increased concentrations at day 3.

Chitosan composite coating for bone growth in musculoskeletal implants for drug delivery

Brandico Barr, (Department of Biomedical Engineering)

Over 4 million people in the United States alone have at least 1 internal fixation implant. With dental and musculoskeletal implants, integration of implant into bone is a critical step. Recent studies have shown that members of the statin drug family, such as simvastatin, have similar osteogenic properties to growth factors like bone morphogenetic protein-2. However, the hydrophobic nature of statins presents difficulties for loading into traditional local delivery biomaterials. In this study, we evaluated a chitosan composite coating with calcium-phosphate nanospheres loaded with simvastatin (CaP-SMV) to release osteogenic factors from implants. Liquid chromatography was used to detect simvastatin.

Effect of Raspberry Ketone-Loaded Chitosan Membranes on Saos-2 Cell Growth

Paul Cameron, (Biomedical Engineering)

Electrospun chitosan membranes have a fibrous structure that mimics the extracellular matrix and provides a scaffold for cell growth. Raspberry ketone (RK) is a compound that has shown the ability to reduce the risk of chronic inflammation and expediting the healing process. RK can be loaded onto electrospun chitosan membranes via simple adsorption. This study examined the effect of RK on Saos-2 cell growth. A cell growth study was performed with Saos-2 cells exposed to RK-loaded chitosan membranes. The results of the growth study suggest that RK has no negative impact on the growth rate of Saos-2 cells.

Electrospun Fibrous Branched-Clusters as Fundamental Building Units for Tissue-engineered Cartilage

Kasyap Cherukuri, (Biomedical Engineering)

A large portion of the aging and athletic population suffer from cartilage degradation over time. Damaged cartilage regenerates slowly or not at all, often necessitating knee and hip replacements. This creates a need for a tissue-engineered cartilage solution. In this project, electrospun branched-clusters were combined with chondrocytes in culture to create cartilage-mimicking constructs. After these constructs were fixed, cryosectioned, stained, imaged, and analyzed, the optimum branched-cluster size and culture conditions were determined to create even cell densities. These results indicate that

these constructs have the potential to aid in situ cartilage regeneration.

Antibiotic Elution and Cytocompatibility of Chitosan Derivative Paste for Periprosthetic Joint Infection.

Landon Choi, (Biomedical Engineering)

Periprosthetic joint infection (PJI) is a significant cause of total joint arthroplasty failure. It's in the top 3 causes for failure in both primary total knee arthroplasty (16.8%) and primary total hip arthroplasty (14.8%). Chitosan is a cheap and bountiful biomaterial that is a derivative of chitin, with advantages of biocompatibility and biodegradability. Its versatility allows for fabrication of various physical forms, such as sponges, microbeads, or injectable pastes, which are useful for delivery of antibiotics or other drugs. In this research we investigate a chemically modified chitosan mixture for efficacy in eluting antibiotics and for compatibility with mammalian cells.

Tuning Deep Brain Stimulation Parameters: An Adaptive and Individualized Approach

Masoumeh Heidari Kapourchali, (Electrical and Computer Engineering (EECE))

Tremor is one of the common motor symptoms of Parkinson's disease. DBS is a surgical treatment which implants a medical device into the brain. Currently, a neurologist adjusts DBS parameters manually, every 3-12 month after the surgery. We introduce a data-driven technique for DBS programming which is efficient and adaptive without any changes in the surgical procedures. It handles the dynamic nature of the brain, considers the progressive nature of the disorder and alleviates symptoms while minimizing the side effects. The stimulation is done only when needed which makes the battery life longer and leads to less post therapeutic surgeries.

Magnetic Chitosan Microbeads for Use as a Local Drug Delivery System

David LeVine, (Biomedical Engineering)

This project focuses on optimizing a novel drug delivery system via magnetic nanoparticle-loaded biopolymers actuated by an external magnetic field. Chitosan-based microbeads were fabricated to contain magnetic nanoparticles, rhodamine, and polyethylene glycol dimethacrylate (PEGDMA) as a cross-linker. Beads measured $210 \pm 40 \mu\text{m}$ in diameter, showing a distinct spherical form with dimples across the entire surface of the bead. Preliminary in vivo work shows increased

fluorescence after stimulation with magnetic fields. Further experimentation is planned to investigate drug elution with antibiotics, chemotherapeutics, and proteins.

Optimal funding allocation framework for mixed transit fleet subject to equity and emission constraint

Huan Ngo, (Civil Engineering)

Agencies and policymakers require equitable and optimal allocation of funds for transit asset management. This research aims to develop a strategic transit resource allocation of funds and improvement program plan for each individual bus, within the given constraint (federal budget, policy) to maximize the overall benefit (measured by total passenger miles traveled) throughout a planning horizon. This research incorporates equity in transportation planning and bus replacement strategies that reduce environmental impact, especially in emission. It is then applied to real-world data using a set of transit agencies across the State of Tennessee.

Evaluation of Two Different Neutralization Methods for Chitosan Coatings for Bone Implant Applications

Kevin Patel, (Biomedical Engineering)

Chitosan has been extensively investigated as an organic coating for musculoskeletal and dental implants due to its osteoconductive properties and capability to deliver local therapeutic agents. Since chitosan is dissolved in dilute acid, residual acid components must be neutralized post-coating. Neutralization affects coating surface chemistry and physical properties. This study aimed to compare the effects of NaOH neutralization versus phosphate buffer neutralization on coatings on commercially pure titanium. Properties evaluated were contact angle, swellability, protein elution, coating adhesion, cell attachment/proliferation, and cell mineralization. Results show phosphate buffer neutralization produces coatings with properties more favorable for bone implant device applications.

Development of Reference Electrode for Blood Sample Analysis Based on Plasticized PVC

Gautam Thamizharasan, (Biomedical Engineering Department)

Ion-selective electrodes (ISEs) are chemical sensors used in commercial blood analyzers to measure specific ions and gases (pH, Na⁺, CO₂ etc.). Part of the measurement system in ISE is the reference electrode (RE). This research focuses on evaluating REs based on PVC membrane containing ionic liquid (IL). Several different ILs were used with PVC and plasticizer. These reference electrodes were tested in a range of NaCl and KCl concentrations to measure their response and stability. The flow sensitivity of the REs was also evaluated. The selected membranes will be tested in a flow system in commercial blood-gas type analyzer.

LIBERAL AND FINE ARTS

The North Korean regime drastic change since the death of Kim Jong-il

Paula Diaz Alexejew, (Political Science)

Why has the North Korean regime changed politically and socially since the death of Kim Jong-il and the rise of his son Kim Jong-un? A parallel comparison of patterns of the North Korean regime under Kim Jong-il and Kim Jong-un. Perhaps Kim Jong-un has taken a stricter authoritative perspective to further inflict fear within North Korea to stabilize his totalitarian dictatorship. It seems as if his strict law enforcement and global influence (participation) have become more drastic and violent to legitimize his power domestically and internationally.

Matriarchy and Its Forgotten History; American Hoodoo and African Spirituality

Sydney Kesler, (African and African American Studies)

The omnipresence of patriarchy has surpassed Matriarchy and the role it played historically for both African people and the descents of African people in America. In Africa this is seen through governmental regulation and colonization. In America the suppression of Matriarchy happens through the exploration of spirituality. While Matriarchy definition is reflective of patriarchy, it operates without the oppression and dehumanization. This is explored through the spirituality of American hoodoo and through the customs and heritage of African traditions. Both operate through Matriarchy and presents forms of Black Liberation.

Two Waves of Feminism in Relation to Jesus and the Writings of Paul

Hannah Quinn, (English)

Does the Bible support any form of feminist thought? To answer this question, one must understand the divide within the feminist movement in the 1970's that split the feminist agenda into two types - equality feminism vs gender feminism. My research examines popular literature in this time period to discover the differences between these two lines of thought. My research focuses on Jesus's dialogues with the Samaritan Woman and Mary Magdalene in the Gospel of John and chapter five of Paul's letter to the Ephesians to draw parallels between parts of the New Testament and feminist thought.

LIFE & HEALTH SCIENCES

Comparison of Elution of Antibiotic from Manually Applied and Spray Deposited Phosphatidylcholine Coatings

Zoe Harrison, (Biomedical Engineering)

Phosphatidylcholine (PtC) can be loaded with antimicrobials such as ciprofloxacin or cis-2-decenoic acid to create a crayon-like solid, applied by "drawing" coating onto an implant. While manually applied coatings have demonstrated efficacy, they show limitations in handling for surgical use. This study investigates a system to spray PtC onto devices via aerosolization to determine whether this spraying method provides similar elution capabilities to the manual method. While coating uniformity improved with aerosolization, less coating was deposited. Manual coatings showed higher elution concentrations through day 7, while the spray coating only eluted sufficient concentrations through day 3.

The Effect of Leucine Supplementation on Liver Protein Synthesis in a Cancer Cachexia Model

Aaron Persinger, (Health and Human Performance)

Cancer induced cachexia plays a major role in the interruption of protein synthesis pathways in the body. Diminished protein synthesis leads to muscle atrophy and loss of quality of life. Branched Chain Amino Acids have been shown to increase protein synthesis. We supplemented Leucine into the food of mice which had an injection of cancer cells to see if the leucine could counteract the effect of cachexia. We analyzed 6 different proteins to examine live protein

synthesis regulation. Our results suggest our dose of leucine does not impact liver protein synthesis in a cancer cachexia model.

Regulation of Cellular Phenotype by GALNT3 in Mammary Epithelial Cells

Adiba Safi, (Biological Sciences)

GALNT3 (UDP-GalNAc transferase 3) is a key O-glycosyltransferase that regulates the folding and localization of proteins important in epithelial state maintenance. We reduced the expression of Galnt3 in human mammary epithelial cells (HMECs) using two independent Galnt3 shRNAs and examined its impact on the cellular phenotype. Immunofluorescence staining showed shGalnt3 cells have increased filamentous actin and mislocalized E-cadherin relative to control HMECs. Importantly, qPCR analysis of the remaining 19 human Galnts revealed no compensation in their expression with loss of Galnt3. Together, these data demonstrate the importance of GALNT3 as a key regulator of cellular phenotype in mammary epithelial cells.

IS IT POSSIBLE TO CREATE A LOW FAT, HIGH NUTRITIONAL VALUE, AND ALLERGEN FREE CUPCAKE

Racheal Speltz, (Nutrition/Dietetics)

"Bryan" is a 12 year old male with Mitochondrial Disease (MD), food allergies, and fat malabsorption. The purpose of the project was to create an allergen free, low fat, and high nutritional value cupcake for Bryan. By creating this cupcake, the goal is to decrease the financial burden of dietary supplements for treatment for MD. The result of the project showed an 89% decrease of fat from the standard recipe. Vitamin B2 was increased to fulfill 21.5% of its recommended daily allowance, while iron fulfills 4.93%. In conclusion, the results of the experimentation was a success.

MAP3K4 Dependent HDAC6 Expression Is Required for Trophoblast Stem Cell Differentiation into GCM1+ Syncytiotrophoblasts

Austin Sturdivant, (Biological Sciences)

Epithelial trophoblast stem (TSWT) cells undergo differentiation-induced epithelial-to-mesenchymal transition (EMT), losing cell-cell adhesion while acquiring the expression of mesenchymal markers and invasiveness. TS cells expressing kinase-inactive MAP3K4 (TSKI4 cells) display features of EMT while maintaining stemness. The histone deacetylase, HDAC6, is upregulated at the message, protein, and

activity level in TSKI4 cells compared to TSWT cells. Therefore, we hypothesized that HDAC6 expression may be regulated differently during differentiation of TSWT and TSKI4 cells. To test this hypothesis we performed real-time, quantitative PCR and western blotting to determine the expression of HDAC6 message and protein over ten days of differentiation.

Aspirin upon Arrival: Increasing Administration in Emergency Rooms for Patients at Risk

Maranatha Weaver, (Nursing)

Aspirin upon arrival is the national standard of care for patients presenting to the Emergency Department with symptoms of Acute Coronary Syndrome or a non-hemorrhagic stroke. The purpose of this quality improvement project is to increase the administration of Aspirin to eligible patients upon arrival to an Emergency Department. Pre and post intervention data was collected via a chart review. Interventions included education about Aspirin administration for nurses who work on the unit, as well as a poster and reminder cards, with an expected result of increased rates of Aspirin administration to eligible patients presenting to this Emergency Department

MATH & COMPUTER SCIENCES

Artificial Intelligence - Combining Syntactic, Semantic, and Discourse Parsing for Knowledge Extraction

Noah Coomer, (Computer Science)

One of the outstanding problems in artificial intelligence is knowledge extraction from text, also known as machine reading. Various research groups have worked on these problems independently, but in order to apply their solutions to knowledge extraction, the disparate linguistic annotations produced by each solution must be combined into a single annotation. In our research, we have combined the Stanford syntactic parser, the Edinburgh semantic parser, and the University of Arizona discourse parser into on pipeline that can generate the above

annotations along with providing part of speech tagging, named entities, coreference chains, and discourse trees on-demand.

Removing Redundancies and Noise from Large Scale Text-Based Social Media

Marshal Hayes, (Computer Science)

Humans are able to quickly make conclusions of people, organizations, and products based on simply reading text information about each respectively. However, sometimes much of the information is redundant and not useful. We develop an approach where we construct a deep network architecture capable of understanding semantic-level symmetries in review data. The idea behind our approach is that reviews that provide new, useful information will have significantly different information as compared to others. Apart from review data, we envision our approach to have several applications in de-noising large scale text data, allowing users to identify the most significant information quickly.

SOCIAL AND BEHAVIORAL SCIENCES

Examining the Effect of Diet on Mesolimbic Dopamine Release and Psychostimulant Addiction

Jasric Bland, (Psychology)

This study compared the effects of a high fat diet, lower fat vegan diet, and standard lab chow on mesolimbic dopamine transmission in mice. Mice on the high fat diet had reduced dopamine release and a decreased dopaminergic response to a psychostimulant compared to mice on the other diets. These findings indicate that diet can alter dopamine release and the way this reward pathway responds to drugs of abuse such as psychostimulants. Understanding the interaction between diet and neurotransmission may lead to improved treatments for related disorders.

Teaching Operant Conditioning Principles to Change the World: One Behavior at a Time

Sarah Cassidy, (Psychology)

Operant conditioning is a method of learning consisting of adding and/or taking away rewards and punishments to increase or decrease the likelihood of a behavior. Instructors have employed various methods to teach operant conditioning principles, as it is a challenging topic for students to learn. This course evaluation assessed the efficacy of the Tri-Modal Method in teaching operant conditioning principles. We

assessed students' accuracy in differentiating between these principles using a pre/post assessment. T-test analyses were conducted to determine which principles instructors need to reteach for students to master operant conditioning.

Diet Alters Behaviors Related to Anxiety and Addiction Using Open Field

Kenya Ector, (Psychology)

The current study compared the effect of a high fat diet (Western diet), a low fat diet (Daniel Fast diet), and standard lab chow (control diet) on behaviors related to anxiety and addiction in mice. Mice were placed on one of these diets at 6 weeks old, weighed weekly, and evaluated via open field testing at 4, 8, and 12 weeks following diet initiation. The Western Diet increased weight gain, decreased locomotor activity, and increased behavioral signs of anxiety compared to the other diets. Understanding interactions between nutrition, behavior, and mental functioning may improve treatments for related disorders.

Perception of stigmatized groups through the eyes of undergraduate college students

Bre'Anna Free, Sarah Cassidy (Psychology)

1:4 college students experience mental health issues. People diagnosed with psychological disorders are at risk of being stigmatized. The LGBTQ+ community is often stigmatized. ~7% of students identify as LGBTQ+. Stigma can cause a barrier to seek help. We used the Help subscale of the Psychological Stigma Assessment and two subscales of the Ally Identity Measure: the Knowledge and Skills subscale, as well as the Openness and Support subscale to explore the relationship between stigma towards people with psychological disorders and the LGBTQ+ community. 245 students completed an assessment. Pearson correlations indicated that there were not statistically significant relationships.

Life Satisfaction, Self-Regulation, Motivation to Change, & Family History: Predictors of Young Adult Alcohol Misuse?

Sonia Hopkins, (Psychology)

Alcohol misuse causes health problems among young adults and is an economic and global burden. Life satisfaction, self-regulation, and motivation to change predict alcohol misuse. However, it is unclear if these variables predict equally across different groups. It is necessary to test moderators to determine predictive utility across groups. The goal of this study is to examine the interaction between these variables and family history of problematic alcohol use. We hypothesize that lower life satisfaction, self-regulation, and motivation to change will be associated with greater alcohol misuse. These relations will be moderated by positive family history of problematic alcohol use.

Mesolithic Ochre Crayons: Molding the Art Supplies of the Past?

Victoria Johnsey, (Anthropology)

This presentation explores the methods and materials possibly employed by Mesolithic people to mold "ochre crayons" as well as the possible benefits of producing these items. The aim of this research is to determine the likelihood that Mesolithic people molded ochre crayons. Data about ochre usage and Mesolithic material culture was collected by reading ethnographic accounts and archaeological papers. Experimental archaeology was performed to determine if molding ochre crayons would have been feasible and beneficial to Mesolithic people. It is hoped that this research will help to inform the argument surrounding the authenticity of ochre crayons.

Is Focusing Internally Necessary for a Mindfulness technique to Work?

Chelsea Jones, (Psychology)

Research suggests that mindfulness-based stress reduction (MBSR) can lower anxiety. However, little has been studied about whether the internal focus of MBSR is necessary for increasing a state of mindfulness or lowering anxiety. The purpose of this study is to examine an internal MBSR technique-body scanning- and compare it to a technique that focuses on an external object. Results indicated that focusing techniques, whether internal or external, can reduce anxiety. The findings also suggest that a brief mindfulness technique may not increase mindfulness.

Examining the Regulatory Role of D2/D3 Receptors on Dopamine Release in the Nucleus Accumbens

Nick Paige, (Psychology-Behavioral Neuroscience)

Dopaminergic dysfunction in the mesolimbic pathway has been linked to conditions such as addiction, ADHD, autism, and depression. Dopamine autoreceptors sit on the presynaptic terminal and regulate dopamine release, making them a prime suspect for dopamine imbalances leading to conditions aforementioned. This study aimed to distinguish the regulatory role of D2 and D3 receptors on NAc dopamine release using in vivo fixed potential amperometry in anesthetized mice. Results indicated D2 receptors function as autoreceptors, while D3 receptors do not. Autoreceptors may be a therapeutic target for dopamine-related disorders; therefore, determining these specifics regarding dopamine autoreceptor functioning has critical clinical relevance.

Are clinicians trusted more when they involve the patient in treatment choices?

Alice Pham, (Department of Psychology)

In clinical settings, there are two disparate approaches to clinician-patient interaction: a paternalism model and an informed-choice model. The paternalism model places the power of choice with the clinician, whereas the informed-choice model places this power with the patient after the clinician has presented the patient with choices for treatment. In this study, participants rated an audio recording in which either the clinician or the patient chose a treatment. Results indicated that patient preferences for involvement in treatment decisions mediate outcomes, suggesting that accounting for patient preferences may improve clinician-patient interactions.

Do Students Believe They Have What It Takes To Succeed?

Sydney Roberts, (Psychology)

Student retention has become an increasingly crucial factor for higher education institutions across the United States. Retaining students and increasing graduation rates is important for these institutions to maintain federal funding, and to continue to benefit from student's tuition payments.. Also, Self-efficacy has been identified as an important predictor of college students' matriculation. This course evaluation evaluates the relationship of students' belief in their skills to succeed from the commencement of a semester to the completion of the semester in a general psychology auditorium class.

GRADUATE ABSTRACTS

BUSINESS

Do Labor Market Payoffs Motivate To Work Harder on the Job?

Dariya Ainekova, (Economics)

I evaluate the extent to which US employees' work effort is associated with mean wages and residual wage inequalities defined within occupation and geographical area. I find that workers elicit greater work effort in occupations and geographical areas which pay more, on average, compared to other labor market segments, and that workers elicit greater work effort in labor market segments which exhibit more variance in pay. I also find that while men are motivated by inequality within their occupation and geographical area to work harder, women are not.

The Economic Impact of Music Festival Tourism in Memphis, Tennessee

Jackson Babb, Carol Silkes (Kemmons-Wilson School of Hospitality Management)

Memphis, Tennessee is the Home of the Blues and the Birthplace of Rock 'n' Roll. Memphis is known for its iconic music scenes like Graceland, Sun Studio, and Beale Street. As such, music tourism is an important factor for the city's economy. Memphis generates revenue by playing host to multiple annual music festivals that capitalize on the city's musical reputation. Music festivals that feature multiple genres, are well-known, and attract out of town tourists will have greater economic implications for a city than music festivals that do not have these qualities.

EVALUATING THE IMPACT OF TECHNOLOGY ON CUSTOMER SERVICE IN THE HOTEL INDUSTRY

LaVonda Clay, (Kemmons Wilson School of Hospitality and Resort Management)

In today's society, technology influences the hospitality and tourism industry. Whether positive or negative, technology dramatically forces the industry to transform and restructure. Customer and employee relations are becoming more obsolete, due to information technology. A positive customer service experience is what any company or business envisions, in relevance to hospitality. Excessive technology usage in businesses causes tension on face-to-face relationships with the customer and employee. Hospitality prides on customer service, while tourism integrates customer relations. In order for these two businesses

to flourish, they will need to illustrate a pathway in balancing the dualities of technology versus direct-customer service.

Textual Analysis of Financial Statements and its Impact on Price

Rasheek Irtisam, (Finance, Real Estate, and Insurance)

Over the recent years textual analysis has gained significant momentum to analyze the sentiment of 10-K reports, newswire messages, and press releases. Loughran and McDonald (JF, 2011) developed six different word lists that reflect the tone of a text in a financial context. I propose a study to investigate if uncertain words in the 10-K statements contribute to information asymmetry, which is measured by price impact. We hypothesize that, uncertain tones in the 10-K statements give the informed trader advantage over the marginal traders and liquidity providers by leaving the investors ambiguous.

Does communication matter? B2B customer satisfaction with salesperson communications and the resulting effect on loyalty

Gerard Kelly, (Marketing & Supply Chain Management)

Relationship marketing in a business-to-business (B2B) context leads to increased loyalty from buyer/customer. Research has demonstrated, though, that this customer loyalty is bifurcated between loyalty to the salesperson and loyalty to the seller's firm, with "salesperson-owned" loyalty often much stronger than the customer's loyalty to the selling firm. Extant literature provides little insight into salesperson-specific and selling firm-specific behaviors that lead to each type of loyalty. This research is expected to contribute substantially to the academicians' and practitioners' understanding of the value of salesperson communications.

Causality and Price Discovery between CDS Premia and Bond Spreads

Yi Lu, (Economics)

I investigate the relationship between credit-default swap and bond markets in a panel time-series framework for corporations trading on the NYSE. CDS and bond spreads represent the risk premia for a corporation's risky instruments. Theoretically, the risk premia should be equal, but we find a significant difference. First, I explore short-run mean-reverting behavior for selected securities. Second, I estimate a long-run cointegrating relationship using firm-level VAR model that estimates how shocks from one market impact the other, and a VEC model which estimates the market adjustment process.

Short Term Dynamic Price Limits: The Limit Up-Limit Down and Special Quote Rules

Shawn McFarland, (Finance, Insurance, and Real Estate)

Exchanges commonly use circuit breakers to slow down trading to mitigate excess volatility and avoid erroneous or highly uninformed trading. Both Japanese and US markets use short-term, dynamic price limits. We evaluate the effect of these price limits on price discovery, trading volume, and volatility, and the magnet effect. We find that the limit up-limit down rule interferes with price discovery less often than the Tokyo Stock Exchange price limit. We find evidence supporting the volatility spillover hypothesis. We find no evidence of the magnet effect associated with LULD and the opposite of the magnet effect for SQ.

The Global Bitcoin Market: Price efficiency, price clustering, and the location of trade

Jonathan Miller, (Finance Insurance and Real Estate)

Bitcoin, the first cryptocurrency with an aggregate market value of about 263 billion USD, is traded worldwide, especially in the US, India, and China. Gaining market share, Litecoin, Ether, and Ripple are the other leading cryptocurrencies and we analyze them in the study. Using runs tests and variance ratio tests, we reject the hypothesis that Bitcoin prices are weak form efficient. We also document barriers to trading of Bitcoin that result in difficulties in arbitrage so that local-currency prices for Bitcoins in India and China deviate from USD and EUR prices.

Gender-specific cancer survivorship and labor market attachments: Evidence from 2008-2014 MEPS data

Ahmad Osmani, (Economics)

This study uses the nationally representative US Medical Expenditure Panel Survey (MEPS) longitudinal data waves, for the 2008-2014 period, and the correlated random effects and over-dispersion models that address the potential endogeneity of cancer in the labor market outcome equations. Separate models are fitted using subsamples of those surviving gender-specific cancers. We detect substantial differences between male and female labor market outcomes. Our robust estimates confirm that gender-specific cancers adversely affect the likelihood of employment for men and women.

BIG DATA AND CYBERSECURITY: EVIDENCE FROM TEXTUAL ANALYSIS IN ANNUAL REPORTS

Min Ou, (Fogelman College of Business & Economics)

An ever-increasing cyberattacks at high profile public companies have cost more than five percent of their revenues. Big Data and Data Analytics can be used to identify, assess and manage the risks of cyberattacks. They have the potential to change the landscape of businesses regarding customer engagement, automating operation processes, and predictive analytics for decision-making. This research constructs novel measures of financial and non-financial indicators by using textual analysis of firms' annual reports and their ability to predict cybersecurity attacks.

The Association between IT Governance, Board Risk Oversight, Managerial Strategies and Cyberattacks

Shihui Shen, (Business Information Technology)

A growing incident of cyber hacking and security breaches of information systems (e.g., Sony, Targets, JPMorgan Chase, Home Depot) threatens sustainability of many firms and cost the U.S. economy more than \$100 billion annually. Firms should take these threats seriously and improve their corporate governance and compliance and risk assessment and controls to effectively combat cyber hacking and cyber security breaches. Existence and persistence of cyberattacks has risen the expectations for the board of directors to exert greater risk and compliance oversight and for executives to develop and implement managerial strategies for risk management processes to combat cyberattacks.

Premiums Paid for Part Time Work: A Look at Healthcare Occupations

Jennifer St. Clair, (Economics)

The degree to which part-time schedules are penalized varies greatly across occupations. We document the evolution of the part-time penalty for thirty-six healthcare occupations in the United States over the period 1980-2016. Most occupations outside of healthcare impose a part-time penalty on hourly wages. In contrast, many healthcare occupations exhibit no part-time penalty, and some even seem to reward a part-time work schedule. Physicians and surgeons, and dentists are among the healthcare occupations with the highest part-time premiums. We also find that the share of part-time workers in these professions has steadily increased over the period under study.

**Minimalism for Information Security Training in Organizations:
Relationship between Information Security Training and Employees'™
Compliance**

Qiunan Zhang, (Business Information Department)

Users' noncompliance with information systems (IS) security policies is increasingly cited as a key IS security problem in organizations. Although IS security training is often provided extensively in organizations, some reports have indicated a lack of significant improvement in employee IS security compliance. In this research, we use a minimalist approach to consider the relationship between frequency of IS security training and incident rates. Data will be collected through a questionnaire. Results of this research will be used to develop a new plan to improve employees' compliance related to IS security training and continue to measure its effectiveness.

EDUCATION

Like it or Love it: Exploring Elements Affecting Student's Mathematical Achievement

Ezell Allen, (Educational Psychology and Research)

Mathematics achievement, both in high school and early in college, is one of the strongest predictors of college completion. Hence, this study uses structural equation modeling to evaluate a model linking mathematics beliefs and achievement proposed by Ford (2017), which expanded on Eccles' model of achievement-related choices (2005) and Middleton's model of mathematics achievement (2013). While Ford (2017) used a nationally-representative sample of 9th graders, this study focuses on a sample of students enrolled in sections of two algebra-

focused remedial math courses at a community college near a midsize metropolitan southern US city.

Simulation in Occupational Therapy Education: A Qualitative Look at Student Attitudes and Perspectives

Kendal Booker, (EDPR)

This qualitative study uses a phenomenological approach to explore the lived experiences, preferences, and perceptions of students who have encountered simulation in occupational therapy education. It is an initial study focusing on how simulation encounters hone critical and clinical reasoning. The findings demonstrate learning is fostered through solidification of didactic material, increased self-awareness, and an elevated sense of field readiness through simulation encounters. The study revealed student preferences for moderate stakes simulation encounters with a heavy emphasis on formative objectives versus summative. In conclusion, six areas were identified for future development of simulation in education.

What is a Game?: Collaborative Games as Effective Learning in Higher Education

Kiersten Brockman, (Communication Studies)

Instructors, especially those responsible for mandated general education courses, have a large potential impact. Unfortunately, instructors receive little to no training on how to effectively teach which often results in a teaching philosophy which maintains the instructor-centered, knowledge drop style of lecture only courses. Instructional communication scholars have discovered significant relationships between use of games, collaboration, and positive learning outcomes. This project analyzed current research for strategies to implement games effectively in college classrooms which resulted in a mind map guide which instructors of any course can utilize.

Adapting: A Study of Faculty Perceptions Towards Adaptive Instruction, Innovation, and Technology

Dustin Duren, (Health Studies)

As time transforms education, methodology also needs to adapt to course instruction. However, there is a challenge to be effective while also meeting each individual student's learning needs. Would that process be difficult? Yes, but not impossible. Through this study, the process of adaptive learning and innovation is examined through the perceptions and concerns of a university instructor. With the exploration of The Concerns Based Adoption Model and surveying the instructor's stages of concern and levels of use, this study will show how faculty feels at changing things up in his or her course to better serve students individually.

American Elementary School Students Engagement and Interaction in the Mobile Science Learning (MS- Learning) Environment

Mahbubul Hasan (Educational Psychology and Research)

This qualitative case study describes the elementary school students' mobile science learning (MS-learning) and their peer interaction and engagement. Eight elementary school students were selected for semi-structured interview, and 46 students were observed in a summer reading program participated in this study. Finally, data from interview and classroom observation revealed that mobile science learning helps young learners in promoting cognitive, affective and social interconnectedness. MS-learning promote cognitive interest among children and makes peer work more enjoyable and cultivate a fun approach of independent learning.

Service Learning Programs in the classrooms for students with EBD

Jennifer Hoggan, (ICL (Special Education))

Service learning (SL) is a course-based, real-life, hands-on teaching and learning strategy that integrates meaningful community service with instructions and reflections by enabling students with EBD (emotional behavioral disorders) to test their knowledge and understanding. Students with EBD in special education exhibit antisocial behaviors, cognitive distortions, and disordering emotions. This presentation will focus on how service learning programs in special education classrooms for students with EBD still continues to merit in K-12 schools despite positive outcomes.

Recommendations to Advance the Field of Emotional and Behavioral Disorders

E. Julie Kamath, (College of Education)

The outdated definition of Emotional Disturbance provided by Individuals with Disabilities Education Act, coupled with the lack of research on female students with Emotional and Behavioral Disorders (EBD) and practical academic interventions for students with EBD have caused a field with the potential to grow and positively impact students to remain stagnant. This project offers solutions at the legislative, research, and school levels to advance the field of Emotional and Behavioral Disorders and equip educators with competent practices and interventions to improve the educational quality of special education students.

Not Worth The Paper It Is Printed On: Online Academic Degrees Fail To Impress Employers

Eric Lavalle, (Educational Psychology & Research)

Enrollment in online academic courses has continued to rise over the years. Additionally, more courses and degrees are offered exclusively online. While this increase continues, more employers are receiving applications from potential candidates who possess a degree from an online college. The increase in online degrees has created a dilemma for employers as well as graduates with online degrees as these online degrees are not valued as highly by employers. While some research has shown that online courses meet or exceed the standards of traditional face-to-face learning, this perception is not reciprocated within the human service industry.

Influence of Student's Perceptions on Their Achievement in Top-Performing Confucius Countries

Isbah Mustafa, (College of Education)

Chinese-Taipei (Taiwan), Hong-Kong, Japan, Korea, and Singapore are the top-performing countries on international tests of academic achievement. The study explores their thinking by using Eccles and Wigfield's model of expectancy-value theory which explains achievement behavior by expectancies-of-success and subjective-task-values, influenced by factors including self-concept. It uses intrinsic-value, utility-value, and self-concept to understand achievement behavior. It uses regression-analysis in SPSS on a nationally representative subset of 24,612 grade eight students from Trends-in-International-Mathematics-and-Science Study 2015. Self-concept is the most significant contributor to math achievement. Utility-value contributes positively except in Singapore. The results of the contribution of intrinsic-value are mixed.

HIGH SCHOOL TEACHERS' MEANING-MAKING PROCESS OF YOGA AS AN EMBODIED SELF-REGULATION TOOL: EXPLORATORY CASE STUDY

Paige Pirkey, (Department of Counseling, Educational Psychology and Research)

High School (HS) teachers play an essential role in providing students with the tools for embodied self-regulation (ESR; i.e., regulate internal and external worlds). Notably, yoga provides the tools, developmentally-appropriate activities, and opportunities to practice and internalize ESR, thereby cultivating benefits across global functioning. Nevertheless, the literature suggests some teachers lack buy-in; further, teachers' meaning-making process regarding yoga as an ESR tool remains elusive. This study explores what can be learned from HS teachers' meaning-making process of yoga as an ESR tool.

ENGINEERING

Early Imaging Based Predictive Modeling of Cognitive Performance Following Therapy for Childhood ALL

Rakib Al-Fahad, (EECE)

Acute lymphoblastic leukemia (ALL), the most common malignancy of childhood and adolescence, accounts for roughly 25% of childhood cancers diagnosed annually with a 5-year survival as high as 94%. This improved survival comes with an increased risk of neurocognitive impairment. Our project is to detect cognitive impairment from structural MRI data. Acute lymphoblastic leukemia (ALL), the most common malignancy of childhood and adolescence, accounts for roughly 25% of childhood cancers diagnosed annually with a 5-year survival as high as 94%.

Focusing of Aerosol Based Charged Nanoparticles with Applied Electrostatic Field

Rayhan Ahmed, (Mechanical Engineering)

The focusing and deflection of electrons and ions using electric fields has been successfully harnessed for many applications. This study explores the possibility of focusing charged aerosol nanoparticles, which are much heavier compared to electrons and ions. The study revealed that charged nanoparticles could also be focused towards a focal point by applying an adjustable electrostatic field along the flight path of the same. This study introduces a non-dimensional parameter χ_e ($\frac{ne\Delta V}{mU^2}$), the ratio of electrostatic potential energy to the kinetic energy of an aerosol nanoparticle that greatly affects the focusing performance, better while $\chi_e < 1$.

Investigation of Cyber Security Issues and Solutions for PV Connected DC Microgrid System

Sultana Razia Akhter, (EECE)

Nowadays, considering the growing demand for the DC-loads and simplified interface with the renewable power generation sources like photovoltaic (PV) system, DC-microgrid could be cheaper and more efficient solutions for the power supply in a small-scale area. Furthermore, integrating the intelligence and internet connectivity with the microgrid system will allow the consumers to engage with the main grid through smart-metering, which will ultimately result in dynamic demand management. However, this feature may pose a cyber-security threat to the microgrid system. This work aims at exploring cyber-security issues and their solutions for the intelligent controllers at the PV connected DC-microgrid system.

Efficient Energy Management for Smart Building System with Advanced Control

S M Mahfuz Alam, (EECE)

The increased usage of comfort equipment in buildings results in the more power demand on the grids. Therefore, effective building energy management system is needed to facilitate the effective operation of the lighting, Heating Ventilation and Air-Conditioning [HVAC], etc., systems based on environmental conditions and inhabitants' comfort. The purpose of this study is to design and implement effective control for automated systems, loads with the renewable energy resources, energy storage and grid power. Moreover, the proposed study will ensure both grid connected and stand-alone operation of the buildings while reducing demand on the grid and cost of energy.

Comparative antimicrobial activity of commercially available veterinary wound care sprays and hydrogels

Rukhsana Awais, Zoe Harrison (Biomedical Engineering)

Infection control in wound treatment require antimicrobial preparations for topical applications. We evaluated the compatibility of seven commercially available veterinary care sprays and hydrogels against methicillin-resistant Staphylococcus aureus(MRSA). Microbial inhibition of each group was measured using turbidity, Bactieterglo and zone of inhibition assays (ZOI). Bacterial Biofilm was formed and the results were recorded after four, six and twenty four hours. Groups having chlorhexidine, chitosan and silver showed enhanced inhibitory action compared to the groups with hypochlorous acid and 24-oic acid. We concluded that the products with chitosan, chlorhexidine and silver proved potential antimicrobial activity in turbidity, viability and ZOI.

Learning to generate data and labels jointly from a sequence of observations

Murchana Baruah, (Electrical and Computer Engineering)

Generative Models plays a significant role in compressing or storing data effectively as well as identifying patterns in the data. Data in real world can be perceived from different modalities. Considering an agent and the problem of sensing visual data and making decisions on the data, we consider the scenario where an agent learns the joint probability of images and its label. Since visual information processing is achieved with a sequence of glimpses, we evaluate a generative modelling technique where both observation and its label is learnt in a sequence.

Development of Prediction Models for Path Based Travel Time Reliability Using Truck GPS Data

Santosh Bhattarai, (Civil and Environmental Engineering)

The goal of this research is to find travel time (TT) and travel time reliability (TTR) of trucks in a network for recurring and non-recurring congestion and to identify relationships of various roadway geometry, traffic exposure, crash characteristics, weather patterns on TT and TTR. Two models, based on truck TT and TTR, are developed and then applied to the Freight Analysis Framework (FAF) of Shelby County in Tennessee, with eight weeks of truck GPS data. The results show that the non-recurring congestion has lesser TT and TTR than recurring congestion.

Evaluation of Lyophilized Chitosan Derivatives for Local Degradable Antimicrobial Delivery

Logan Boles, (Biomedical Engineering)

Infection is a serious complication that affects up to 30% of open fractures in civilian populations and nearly 40% in U.S. military personnel. Chitosan, a natural biopolymer, has been developed into therapeutic delivery systems and shown to be biocompatible and biodegradable. This abundant polymer also possesses reactive functional groups that make it amenable to chemical modification. Two derivatives of chitosan, trimethyl chitosan and polyethylene glycol diacrylate chitosan, were evaluated by performing elution, degradation, and cytocompatibility assays. The primary objective of this research was to match the degradation rate of the local delivery device to its elution profile without increasing cytotoxicity.

A self-consistent model for the ion flux coefficient at arbitrary ion-neutral collisionalities

Harjindar Chahl, (Mechanical Engineering)

Collisions between ions and particles, as well as particle-particle collisions play an important role in determining charging of aerosols and dusty plasma systems. Determination of the collision rate coefficient for the transition regime has posed challenges when attractive coulombic potentials are included. Through the use of the Langevin equation, the distribution of the mean first passage time of ions were calculated and a self-consistent model was developed that accurately calculates the collision rate for the entire range of Knudsen numbers KnD and potential energy to thermal energy ratio Γ_c . The model converges to the correct continuum and free molecular limits.

Controlling and Creating Novel Bioactive Implant Material Surfaces via Electrospray Additive Manufacturing

Ewe Jiun Chng, Christopher Chattman (Mechanical Engineering)

This project focuses on the development of an electrospray technology to coat model Titanium surfaces with chitosan and asses their adhesion properties to explore their potential for real implant treatment. Current application technique for the implant coating of chitosan is through solution casting. This method limits the coverage of Chitosan on complex surfaces of implants, difficult to control the thickness of the coating and produce excessive wastage. This research aimed to assess the effectiveness of electrospray method as a delivery method to aerosolized Chitosan in order to coat complex implants with precise thickness control and multilayer coatings for timed drugs delivery.

Computational modelling of aqueous humor dynamics and drug delivery for Intraocular-Pressure Control in Glaucoma

Jabia Chowdhury, (Electrical and Computer Enineering)

Elevated intraocular pressure (IOP) is a significant risk factor of developing glaucoma. IOP elevation is due to imbalance in the aqueous humor(AH) production by the ciliary body and outflow rate in the trabecular meshwork. We present a computational model of sustained delivery of ocular pressure lowering drugs such as Timolol Maleate to the anterior segment of the eye using drug infused contact lens while simultaneously modeling the AH dynamics as a fluid-structure interaction (FSI) model. Models were implemented in COMSOL Multiphysics.

Power Fluctuation Minimization of Variable Speed Wind Generator System by MPC-Based Battery Energy Storage

Morteza Daviran Keshavarzi, (Electrical and Computer Engineering)

Due to random wind speed variations, a wind generator encounters power, frequency and voltage fluctuations. In this research, the battery energy storage (BES) is collocated with variable speed wind generator system to provide smooth power, ensuring stability in grid voltage and frequency. A model predictive control (MPC) strategy is proposed to control the DC-DC converter duty cycle in order to regulate the charge/discharge of the battery energy storage. By managing the State of Charge (SoC), the MPC based strategy considers battery efficiency and life during charge/discharge operations.

Analyzing the Effects of Cyber-Attacks on the Power Quality of Smart Hybrid Grid

Sagnika Ghosh, (Electrical and Computer Engineering)

A smart hybrid grid usually consists of renewable energy sources like wind generator, photovoltaic (PV) system, conventional synchronous generator, energy storage system (ESS) and some loads. The controllers of the smart microgrid devices are regulated through an internet based supervisory control and data acquisition (SCADA) system. Thus, there is a high possibility of cyber-attacks on various components of a microgrid. This work investigates the effects of cyber-attacks on different controllers of the microgrid devices. This work proposes a detection and mitigation technique for cyber-attack and thus improves the power quality of the microgrid.

Development of a Polymicrobial Murine Model of Periprosthetic Joint Infection

Michael Harris, (Biomedical Engineering)

Preclinical animal models of orthopedic infection are required to screen drug delivery systems for efficacy as well as adverse in vivo reactions. The goal of this study was to adapt an existing animal model to include both *S. aureus* and *P. aeruginosa*. A stainless steel wire was inserted into the femur of mice and the wound was inoculated with *S. aureus* and *P. aeruginosa*. Bacterial load was determined after one week for wires and surrounding bone tissue. The presence of live *S. aureus* and *P. aeruginosa* in all control animals indicates that polymicrobial biofilms were established at the surgical site.

Tuning Deep Brain Stimulation Parameters: An Adaptive and Individualized Approach

Masoumeh Heidari Kapourchali, (Electrical and Computer Engineering (EECE))

Tremor is one of the common motor symptoms of Parkinson's disease. DBS is a surgical treatment which implants a medical device into the brain. Currently, a neurologist adjusts DBS parameters manually, every 3-12 month after the surgery. We introduce a data-driven technique for DBS programming which is efficient and adaptive without any changes in the surgical procedures. It handles the dynamic nature of the brain, considers the progressive nature of the disorder and alleviates symptoms while minimizing the side effects. The stimulation is done only when needed which makes the battery life longer and leads to less post therapeutic surgeries.

Improved Modelling for Harnessing Energy from Wind Turbines on Trains

Mario Hyman, (EECE)

Most wind powered electricity generation systems are stationary and heavily dependent on the force and direction of the wind. Therefore, the availability of sufficient wind input varies based on the status of circumstantial factors including location and time of day. Alternatively, the wind displaced by fast moving vehicles, in particular by trains is routinely available in locations worldwide. Previous research has been aimed at designing wind turbine models that maximize the output potential of the system. This work aims to develop a more realistic model of the which includes the inherent drawbacks of the system and their potential solutions.

Elemental and histological study of the growth plate reserve zone-subchondral bone interface

Masumeh Kazemi, (Biomedical Engineering)

Growth plate (GP) mammillary processes provide an interlocking interface of hills and valleys that continues to evolve with bone growth. Metaphyseal mammillary processes are formed by endochondral bone growth and it matches with the topographical pattern of epiphyseal-side. However, it is not clear how mammillary processes develop in epiphyseal-side. We hypothesized that the reserve-zone (RZ) might be responsible for development of subchondral-bone-plate (SB) undulation. The purpose of this study was to characterize the chemical and histological features of RZ-SB-interface (yearling domestic cattle) for evidence of cartilage and bone formation contributing the mammillary process development on the epiphyseal side of GP.

Brain Connectivity Analysis of Normal Hearing and Hearing Loss Listeners

Md Sultan Mahmud, (EECE)

We localized the source of EEG data into the cortical surface and extracted the time series data from the 68 regions of Deskin (DK) atlas. We analyzed the brain connectivity through the Granger Causality and Phase Transfer Entropy. This results showed that normal hearing and hearing loss listeners' connectivity are not the same. We also performed a statistical analysis in the eight regions those are associated with the auditory and language processing and found that the primary auditory and Broca areas are significant. It is noticeable that hearing loss listeners utilize the top-down modulation to perceive the sounds.

Identifying Demands for Public Transportation in Shelby County Based on Demographics

Ehsan Momeni, (Earth Sciences)

In Shelby County, TN, more than 90% of house-to-work journeys between 1990 and 2010 were made on private vehicles which is not an environment-friendly behavior. This study contributes to efforts for improving public transportation by identifying neighborhoods with the highest demand of it. Analyses of Census 2010 data show a significant relationship between the use of public transportation and socio-demographics. This study identified North Memphis, including Frayser, with the highest demand of public transportation based on land-use, age, ethnicity and education. Results will help urban planners to make reliable plans for public transportation in Shelby County.

Template-free synthesis of hierarchical mixed-metal cobaltites: Electrocapacitive and Theoretical study

Dipesh Neupane, Tej Poudel (Physics and Materials Science)

The present work elucidates synthesis and electrocapacitive performance of cobaltites nanostructured particles synthesized using template free urea assisted hydrothermal method. Morphology and size of the synthesized cobaltites were examined by using scanning electron microscopy. Hierarchical structures namely fibrous and urchin-like microsphere were observed for the cobaltites. Electrochemical measurements were performed using standard 3-electrode system with 3 M KOH electrolyte via cyclic-voltammetry and galvanostatic charge-discharge methods. Amongst the cobaltite studied, NiCo₂O₄ displayed high surface area (46.05 m²/g), high specific capacitance (173 F/g at 5 mV/s) and energy density (7 Wh/kg). The sp-capacitance of all the cobaltites depends in surface areas.

AEROSOL DEPOSITION OF TiO₂ FILM AT ROOM TEMPERATURE FOR DYE-SENSITIZED SOLAR CELLS

Prashant Parajuli, (Herff College of Engineering, Mechanical Engineering)

Dye-sensitized solar cells utilize a dye as a light absorbing material which in association with semiconductor (TiO₂) undergo charge separation to function as a photovoltaic device. Since, TiO₂ layer is the foundation layer of solar cell, the morphology as well as the integrity of this layer highly affects the performance of solar cell. Aerosol deposition method (ADM) carried-out at room temperature utilizes dry-dispersed aerosol unlike conventional techniques, which use additives and high temperature sintering for film formation. During ADM nanoparticles are accelerated through a nozzle to high kinetic energy which is converted to bonding energy upon impaction on substrate.

A Morphometric Analysis of the Pig Proximal Femoral Epiphyseal Plate

Ron Perrone, (Biomedical Engineering)

In young growing vertebrates, the head of the femur is attached to the neck by a cartilaginous joint comprised of growth cartilage with an interdigitating arrangement of various size undulations, called mammillary processes, and a perichondrium. Occasionally the joint separates, a condition known as slipped capital femoral epiphysis (SCFE). It has been suggested that mammillary processes function to reduce the likelihood of such a slip. After removing soft tissues from the proximal ends of eight mongrel pig femurs of varying ages, the exposed growth plate surfaces were scanned with a high-resolution laser scanner allowing for morphometric analysis.

A Computational Study Of Turbine Blade Trailing Edge Internal Cooling

Nadim Reza, (Mechanical Engineering)

Modern gas turbine efficiency is improved by active cooling of the turbine blade trailing edge. State-of-the art technology improves the heat extraction rate by placing cylindrical pins within an internal passage through which cooling gas flows. A novel design is proposed in which top-to-bottom stream-wise slots are cut through the center of the pins to augment cooling. Computational simulations of flow with the proposed design reveal a significant improvement in cooling ability as compared to the currently used solid pin arrays.

Detecting Progression of Glaucoma Using a Convolutional Neural Network (CNN)

Ali Salehi, (Electrical Engineering and Computer Engineering)

Optic nerve damage due to glaucoma is observable as changes in the optic nerve head (ONH) region of the eye. Glaucomatous changes can be estimated from the optical flow of confocal images of the ONH. We present a method that leverages the convolutional structure to efficiently train the CNN to detect general motion field using a collection of synthetic image sequences with basic space-invariant motion structures. We demonstrate the performance of our method 1) for standard optical flow benchmark datasets and 2) for detecting glaucomatous motion fields from confocal microscopy image sequences of normal eyes and eyes with glaucoma progression.

A Novel Non-invasive Approach for Continuous Monitoring of the Intraocular Pressure in the Eye.

Hanieh Shabanain, (Electrical and Computer Engineering)

Intraocular pressure (IOP) is one of the leading risk factors of developing glaucoma in the eye. At present, controlling the IOP is the only proven method of glaucoma treatment. The level of IOP continuously fluctuates throughout the day. Therefore, it is important to monitor the IOP continuously. A recent technique uses a pressure transducer embedded in a contact lens. We present a non-invasive approach for continuous monitoring of IOP. We setup two cameras to image the cornea simultaneously. From the 3D sequence depicting changes in the corneal appearance, the underlying 3D motion fields due to IOP fluctuations can be estimated.

Classifying three dimensional human emotions from audio data in German

Sharmin Sultana, (EECE)

Speaker's emotional state could be recognized analyzing his, or her speech. Dimensional emotion model can represent more than one emotional state at a time. In this project, I analyzed acoustic, and prosodic features of spontaneous speech associated with three dimensional emotions. I described how features changes with respect to the change of speaker's emotion. I classified emotions as Arousal: active or passive; Valence: pleasant or unpleasant; Liking: dominant vs submissive. The goal of this project is to evaluate a classifier for three dimensional human emotions based on speech audio data in German.

Chitosan-based magnetically-stimulated microparticles as local delivery devices to assist/reduce systemic treatments

Carlos M. Wells, (Biomedical Engineering)

There have been considerable research efforts directed towards the development of safe, customizable and efficient chitosan-based drug local delivery systems. Primary objectives have included minimizing potential toxic systemic side effects while increasing active treatment concentration at wound/target site. Some viable methods have been developed, however they display first order release patterns that are independent of physiological activity. In efforts to circumvent these disadvantages, "smart" or stimuli-responsive delivery systems are being investigated. This study investigated if a local delivery system consisting of iron oxide Fe₃O₄ (MNP) in conjunction with chitosan microbeads could release loaded agent at or above therapeutic levels.

Investigating Ultrasonic Vocalizations in Rats as a Measure of Chronic Pain

Carey Womack, (Biomedical Engineering)

This project involves testing the viability of recording ultrasonic vocalizations (USVs) in rats to measure chronic pain. If this method proves reliable, it can potentially be used to identify and study phantom limb pain in rats with amputated limbs. Rats often communicate with one another through USVs, any sound with a frequency above 20-kHz. Previous research shows that USVs with frequencies between 20-kHz and 32-kHz (dubbed the 22-kHz range) indicate a negative affective state in rats and are usually emitted in response to an aversive stimulus such as pain.

LIBERAL & FINE ARTS

Diego Rivera for a Greater America: The United States Murals

Fascha DeCrescenzo, (Art History)

My research explores the ways in which Diego Rivera advocated for a new type of social order, specifically in the murals painted in the United States. The murals are organized into three phases: infiltrate, manipulate, and alienate. The first phase is represented by the murals painted in San Francisco in the 1930s. The second phase moves to Detroit and the manipulation of the labor industry. And finally, the destroyed mural in New York displays ways in which public art alienated the public. Together, these murals display Rivera's specific brand of communism and disprove a binary-based system of identity.

'It's not just on the caregiver': A photovoice study of multidimensional Alzheimer's caregiver health literacy

Kelly Ford, (Communication)

Family caregivers of individuals with Alzheimer's disease provide most informal, unpaid care to their loved ones. Since health needs of individuals with Alzheimer's require increasing levels of care as the disease progresses, family caregivers' levels of health literacy and access to health information are especially important. In this work, I use the photovoice methodology to consider the perspectives and experiences of five family caregivers of individuals with Alzheimer's to better understand the concept of health literacy in the context of Alzheimer's caregiving. I identified three interpretive themes: information needs, fragmented care, and disconnection between caregiver and provider.

The Gnadenhutzen Massacre: Frontier Violence, Indian Removal, and American Identity

Seth Harden, (History Department)

In May of 1782, one of the worst massacres in American history took place at the praying town of Gnadenhutzen in the Ohio River Valley. Ninety-six peaceful Moravian Indians were methodically slaughtered by a rogue militia under the pretense of conspiracy after relations on the Pennsylvanian frontier deteriorated. This present research seeks to place the Gnadenhutzen massacre as the turning point of Indian-American relations and the beginning of Native American removals of the 1800s. This research also seeks to uncover certain aspects of American identity formation in the eighteenth century by way of the Gnadenhutzen Massacre.

An architecture beyond the walls: Aligning mind, body, and soul for human connection

Priya Kharel, (Department of architecture)

The pace of urbanization is deepening a sense of social isolation. The brutality of urban settings allows limited access to nature resulting in stress, anxiety and depression among city dwellers. This depression is further exaggerated by social isolation as people have distanced from each other in the frantic urban atmosphere. To bridge this gap of human disconnection, this project proposes an architecture of connection. This connection is achieved by weaving the senses in architecture to help connect with the built- environment. Architecture has the power to

astound us. This project aims for the spiritual awakening of human beings through architecture.

A Description of Music Education Teacher Trainer's Perceptions of and Beliefs About the edTPA

Ellen Koziel, (Music)

This qualitative study addresses the growing body of research about the implementation and impact of edTPA on the training and assessment of teacher candidates at the college/university level from the viewpoint of 12 music education teacher trainers in the state of Tennessee. Ritzer's four dimensions of McDonaldization provided the sociological framework and constructivist grounded theory was used to analyze the semi-structured interviews. Out of 12 respondents, two were for continuing the use of this portfolio assessment as a capstone project for their teacher candidates, two were for discontinuing the edTPA, and the other eight saw both positive and negative aspects.

ARCHITECTURE IN HARMONY: THE SYMBIOTIC RELATIONSHIP BETWEEN HUMANS AND NATURE

Nestor Lobos, (Department of Architecture)

Architecture of today often features building technology that is degenerative and becomes rapidly obsolete. A solution to this dispirited situation is regenerative architecture. Regenerative architecture is a theory based on engaging the natural environment by responding to, and using, living and natural systems to set a foundation for architecture. The goals of regenerative architecture include focusing on the health and wellbeing of inhabitants, environmental conservation, reduction of environmental impacts through building design, and aiding the restorative process of the natural world.

The Music Village: How Architecture and Music can Revitalize Community and Culture

Cameron McLemore, (Architecture)

The rich history of South Memphis neighborhoods has been diminished due to social and economic issues. This has resulted in a missing link within the community. This thesis seeks to understand the relationship of music and architecture by exploring and expressing cultural heritage through music and inclusive community engagement. The goal is to preserve the character and promote the growth of the neighborhood with music as the driving force. Architecturally, this project will provide a place that hosts moments of exploration through space, as well as, creating concepts derived from organizational patterns found in music.

Towards an Aesthetics of Comics: A Reconsideration of Comics Criticism

Jacob Murel, (English)

Contemporary comics studies criticism largely approaches comics from a literary framework. While this may be one valid method of understanding the comics medium, it fails to offer a complete understanding of the nature of comics as a hybrid medium composed of both text and image and how readers understand those constituents parts in unison. The present project aims to explore what the author terms an aesthetics of comics. Through an integration of philosophy, literary studies, and cognitive science, this essay explores an alternative theory for understanding the nature and reciprocal relationship of text and image in this hybrid medium.

Computerized Production of Knowledge: Machine Learning Models as Social Actors

Stephen Paff, (Anthropology Department)

Machine learning is a computer-based means of knowledge production, generating insights beyond the scope of their creation. Machine learning models interact with human users: humans inputting information, tweaking features, and the model advising actions. How do machine learning algorithms function as a means and object of communication between institutions and individuals? Following Bruno Latour's actor-network theory, this review paper explores the transformation of machine learning models into social actors, facilitating interactions between policy-makers, programmers, and implementers. Further, it connects interdisciplinary perspectives to understand computerized knowledge

production and discuss the moral implications of transparency and accountability to subjects in this process.

Archetype house: Importance of architecture to the fabric and health of a community

Martin Pantik, (Department of Architecture)

Recently, housing has been identified as a social determinant of health. Specifically, quality, affordable housing is a powerful determinant of physical and mental health. Housing is more than a roof over one's head. It is a place that contributes to physical and psychological well-being, while promoting social integration of the residents. Archetype House will serve as a model using principles forth by the U.S. Department of Housing and Urban Development, for adequate, affordable housing as a framework. Those principles are: meet the needs of its users, understand and respond to its context, enhance its neighborhood, be built to last.

Let us See & Break Free: An Architectural Hamlet of Support

Sonia Raheel, (Architecture)

Historically, communal places have been used as social interaction spaces and growth places. Currently, there is a lack of an experiential place that serves nontraditional students on the University of Memphis main campus. This thesis seeks to create a third place for nontraditional students which nurtures growth, connections, accountability, acceptance, and diversity, through design attuned to human senses. The aim of this thesis is to create a Resource Center for nontraditional students and Child Care Center with the help of the ideological philosophies; Third Place by Ray Oldenburg, Architecture and Senses by Juhani Pallasmaa, Reiss' 16 Motives of Needs.

Assessing Unique Service Style Restaurants' Consumer Motivations Of Willingness To Pay And Visit Intention

Zeba Razmi, (Kemmons Wilson School and University College)

Restaurants are trying to adopt various innovative, creative, and unique ideas in their business environment. This paper provides the restaurant industry with insight of what attracts patrons to these establishments and what motivations influence their decisions to visit and to pay at these restaurants. It has been hypothesized that "need for uniqueness", "variety seeking", and "novelty seeking" are the motivations for

selecting a unique service style restaurant. The study will be analyzed through random sample surveys from the general population who dine in restaurants. It will provide information to service marketing managers who are undertaking new restaurant opening projects.

The Power of Acoustical Architecture: Understanding How Acoustics Encourage Participation in Worship

Emily Redding, (Architecture)

Human interactions, behaviors, and emotional responses are influenced by sound and the acoustics of a space. Architecture must be designed to respond to acoustics, to create a more successful, holistic design, and an enriching experience for the users. Architectural acoustics play an especially essential role in sacred spaces, as these spaces have unique acoustical challenges in that leaders and members of the congregation both participate and sing. This thesis will explore the way architectural acoustic designs can encourage congregational participation and singing, to touch people emotionally and spiritually, and inspire community to better enhance the worship experience.

Representations of Sexuality in Old Kingdom Dyads: A Discussion of Non-Royal Iconography

Alexandria Salisbury, (Art)

Statues of males and females, known as "pair statues" or "dyads," usually of husbands and wives, first appear during Egypt's Old Kingdom from the Fourth through Sixth Dynasty (2649 - 2150 BCE). My research suggests that gender and hierarchical scale were not directly linked as previous scholars have argued. This study will argue that the representation of the touching gesture made by females functioned as a form of sexual excitation utilized by the man during rebirth. This research will also argue that this depiction of the female's hand is an early form of the feminine epithet "God's Hand".

THE SOUND DESIGN OF ANON(YMOUS) AND THE AURAL IMAGERY OF ECHOIC MEMORY, TRAUMA, AND HEALING

Jo Sanburg, (Theatre and Dance)

Anon(ymous) is a play of the mind, specifically the mind of refugee Anon. The impulse and deep-seated need to remember is at the heart of the human experience. Trauma interferes with memories and human connections, and creates thoughts which are fractured, broken, or hidden. Anon has a

strong will to find the answers, and the need to discover that which is hidden, fix what is broken, and heal. Detailed research into echoic memory, PTSD, music as therapy, and trauma combine with character and socio-cultural analysis to develop soundscapes, aural environments, music, and effects that mirror Anon's disorientation and memory journey.

Wakanda Forever: An Analysis of How "Black Panther" Tackles Race, Gender, and Social Norms

William Suggs, (Journalism and Strategic Media)

In February of 2018 the Marvel film, "Black Panther", premiered to the public. The film had been anticipated since the titular character made an appearance in another Marvel film, "Captain America: Civil War." "Black Panther" has caused widespread excitement across the nation and is considered by some to be the first true black super hero movie. The film garnered acclaim from the black community and has been praised for its almost completely black cast and positive portrayals of black people. This paper seeks to analyze and discuss how "Black Panther" portrays black people against racial, gender and social stereotypes.

Empathic Design: Using Kinesthetic Architecture to Empower Children with Autism

Antonio Tirado, (Architecture)

While designing, architects tend to focus more on physical disabilities than on mental disabilities, often creating an environment unsuitable for people who are mentally disabled. Holistically designed architecture requires that everyone in the environment be considered in the design process. This thesis explores the notion of holistic design for a marginalized group: children with autism. Children with autism have both physical and mental disabilities, and therefore, face many challenges in today's built environment. This thesis will focus on creating an Autism Center to provide a place that offers different environments for learning, discovering, and communicating.

LIFE & HEALTH SCIENCES

Does cognition affect potential benefits of audiologic intervention with OTCs?

Virginia "Ginny" Acosta, Allison Hines (Communication Sciences and Disorders)

As over-the-counter (OTC) hearing aids become more accessible to the general public, research is needed to understand the relative benefits

of traditional hearing aid services for consumers with varying cognitive abilities. In this double-blinded randomized control trial, seventeen adults with bilateral hearing loss with no previous hearing aid experience participated in a one week trial with OTCs. The experimental group received services in accordance with audiologic best practices while the control group received the devices without any professional services. Benefit, skills associated with using the devices, and acoustic output were assessed. The impact of cognition on these outcomes was explored.

Urban-Rural Differences in Opioid Related Drug Overdose Deaths in the United States

Cem Akkus, (School of Public Health)

The US government recently declared opioid epidemic a public health emergency. Despite the media reports that rural areas are hard hit by the opioid crisis, in 2015, six times more drug overdose deaths were reported in urban areas than in rural areas (urban: 45,059; rural: 7,345). This study examines the patterns of urban-rural differences in opioid overdose deaths in the US. Spatial autocorrelation were used to estimate hotspots for opioid overdose death. Adjusted regression analysis indicated that urban areas (OR=1.37), population density (OR=1.45), self-reported depression (OR=2.53), and poor mental health (OR=1.70) were positively associated with opioid drug overdose deaths.

Temporal Relationship Between Lung-Function and Body Mass Index in School-Aged Children –A Repeated Measurement Analysis

Vimala Devi Janjanam, (Epidemiology, Biostatistics, and Environmental Health (EBE) Division, School of Public Health)

The assumption is that higher body mass index (BMI) is a risk for reduced lung-function (FVC, FEV1, and FEV1/FVC). To investigate this, we analyzed the temporal relationship between BMI and lung-function (higher BMI --> lower lung-function and vice-versa) using repeated measurements examined by linear mixed models with delayed effects. BMI was a significant predictor of lung-function depending on age in boys and girls (6-13 years of age). However, also lung-function predicted later BMI, again depending on age. The results discredit a genuine association between BMI and lung-function. Future studies need to identify third factors that influence both, lung-function and BM.

Clinical Subgroup Specific Post-Traumatic Stress Disorder Classification and Biomarker Identification

Liangqun Lu, (Biology)

It has been increasingly recognized that Post-Traumatic Stress Disorder (PTSD) is a psychiatric disorder caused by genetic and environmental interactions. Previous studies have investigated the roles of genetic variation, epigenetic changes and neuroimaging characteristics; however, the details of pathogenesis leading from fear/stress to PTSD are still not clear. There is a pressing need to identify reliable molecular and physiological biomarkers for accurate diagnosis, prognosis, and treatment. In this study, we utilized of multiple omic datasets to build classification models and discover potential biomarkers.

Incidence of ophthalmic complications after administration of intraoral local anesthesia- does it really happen?

Sahaj Parekh, (Public Health- Epidemiology)

Ophthalmic complications are rare after administration of intraoral local anesthesia, but they can be most distressing to the dentist and the patient. The purpose of this study was to evaluate the occurrence of ophthalmic complications after administration of intraoral local anesthesia (2% Lignocaine Hydrochloride) through the nerve block technique in which the highest administered nerve block was IANB (51%) following which PSA (29%), ASA (18%) and Mental Nerve block (2%). As we have seen no occurrence of complications, we concluded that the nerve block is a safe route of administration to achieve dental anesthesia, in terms of ocular complications.

Evaluating plant blindness and botanical literacy in an undergraduate biology classroom

Kathryn Parsley, (Biological Sciences)

Plant blindness is the inability to notice plants in an environment which can lead to the naive and anthropocentric point of view that plants are not important. We hypothesized that students who exhibit plant blindness may also struggle with botanical literacy which is important for making scientifically sound decisions regarding food ethics, climate change, plant conservation, etc. To test this, we developed and administered a Plant Blindness Index (PBI) and Botanical Literacy Inventory (BLI) to students in a botany course at a Midwestern university to evaluate this relationship. We will present these findings and discuss next steps.

Food deprivation significantly reduces self-grooming in meadow voles (*Microtus pennsylvanicus*) in a novel environment

Lyndsey Pierson, (Biological Sciences)

The meadow vole (*Microtus pennsylvanicus*) is a promiscuous rodent that uses scent to communicate information such as sex, age, reproductive status, and territorial boundaries. Females maintain small territories encompassed by larger male territories. In novel environments, a vole may self-groom, a behavior that increases their individual odor field, to advertise their presence to potential mates. In this study, we determined whether food-deprivation influences self-grooming behavior of meadow voles in novel areas. Food-deprived voles significantly reduced their self-grooming behavior in an open-field test. These individuals may lessen self-grooming behavior because they do not want to advertise their poor nutritional state.

Afferent-efferent connectivity between auditory brainstem and cortex accounts for poorer speech-in-noise perception in older adults

Caitlin Price, (Communication Sciences and Disorders)

Aging is often accompanied by hearing loss that leads to poorer speech comprehension, particularly in noise. Reduced speech function in older listeners could result from weaker neural activity within, or reduced signaling between, auditory brain regions coding complex sounds. By recording neuroelectric responses from brainstem and cortex, we show that beyond simply attenuating neural activity, hearing loss compromises the transmission of speech information between subcortical and cortical levels of the auditory system. These findings underscore the importance of brain connectivity in understanding the biological basis of age-related hearing deficits in real-world listening environments.

Loss of Galnt3 Induces Protein Mislocalization in Murine Trophoblast Stem Cells

Deepthi Raghu, (Biological Sciences)

Epithelial to mesenchymal transition (EMT) is a cellular process where non-motile epithelial cells convert to invasive mesenchymal cells. EMT is critical during development and is reactivated during fibrosis and cancer metastasis. Trophoblast stem (TS) cells have been used to define the molecular and epigenetic mechanisms regulating EMT. Mutation of Galnt3 results in severe human diseases like hyperphosphatemia familial tumoral calcinosis. We have found that loss of Galnt3 in TS cells induces EMT characteristics including loss of epithelial markers. Our findings demonstrate that loss of Galnt3

expression changes glycosylation and the localization of key epithelial proteins that control the cellular phenotype.

Comparing Speech Perception and Sound Quality Between Over-the-Counter Devices and Professionally Fit Hearing Aids

Kristie Salemi, Emma Bailey (Communication Science and Disorders)

Of the forty-eight million Americans living with hearing loss, few pursue hearing assistive technology. This study compared speech perception and sound quality between non-programmable over-the-counter (OTC) devices and professionally fit hearing aids. Twelve adult hearing aid users were fitted monaurally with an OTC device and their own personal hearing aid. Participants completed objective speech perception measures and subjective quality ratings with each device, in quiet and noise. Statistically significant differences were found with greater performance for the hearing aid and quiet condition overall. Despite the affordability of OTC devices, hearing aids offer listeners better speech perception and sound quality.

Reverberation and sound-source localization: A comparison of common testing environments

Lipika Sarangi, (School of Communication Sciences and Disorders)

Poor sound localization is considered a major contributor to auditory handicap. Reverberant energy can degrade the accuracy of locating a sound source, but the extent of degradation is unclear. The present study explored the differences in horizontal sound localization in sound-treated and anechoic rooms, using low- and high-frequency filtered stimuli, in quiet and noise conditions. Significant interaction observed between stimuli and environment: participants performed better in the sound-treated room when stimuli were low-frequency and the environment was quiet. Care should be taken while testing in sound-treated rooms, using low-frequency stimuli in quiet condition, to account for effects of reverberation.

Cognitive impairment in multiple sclerosis impacts lexical variation: Evidence from a spontaneous narrative

Victoria Schreiber, Lori Stroderd (Speech Language Pathology)

There is growing appreciation for the contribution of cognitive limitations to communication problems in multiple sclerosis (MS). However, how cognitive impairment impacts spoken language in MS is not well understood. Thus, this study investigated various language measures obtained from a spontaneous narrative speech task to determine differences in language performance for individuals experiencing cognitive impairment in MS relative to healthy controls. ANCOVA revealed that cognitive deficits associated with MS influence lexical variation, as indexed by type token ratio. Results highlight the importance of appreciating cognitive abilities and how they may be reflected in spoken language in MS.

The effect of dietary interventions on intestinal-associated metabolites and immune parameters.

Sunita Sharma, (School of Health Studies)

The obesity epidemic has driven the search for dietary interventions for weight reduction. In the current study, we determined the role of dietary composition and also the timing of feeding on weight loss, with a specific focus on changes in intestinal parameters. Mice were divided into different groups with different feeding protocols. Dietary interventions altered weight gain and body composition and intestinal parameters including small intestinal length and cecum weight. There was no difference in splenic or colonic B and T cell populations, but regulatory T cells numbers were altered with the vegan based diet.

Characterizing Polycyclic Aromatic Hydrocarbons (PAHs) in Ambient Air in the Memphis Tri-state Area

Fariha Sultana, Xianqiang FU (School of Public Health)

Memphis houses numerous transportation and industrial sources that emit polycyclic aromatic hydrocarbons (PAHs). This study aims to measure concentrations of PAHs in ambient air the Memphis area. Samples were collected at 19 sites in Shelby, TN, DeSoto, MS, and Crittenden, AR, and analyzed for 34 PAH compounds. Memphis has higher PAH levels than the national average, e.g., benzo[a]pyrene concentration averaged 1.88 and 0.34 ng/m³ in Memphis and the US, respectively. The cancer risk from PAH exposure was estimated to 1.64 x10⁻⁴. The results warrant technological and regulatory measures to control PAH sources.

Dissociable mechanisms of concurrent speech segregation in noise at subcortical levels.

Anusha Yellamsetty, (School of Communication Sciences and Disorders)

Parsing simultaneous speech is hindered by the signal-to-noise ratio (SNR) in the auditory scene. The synergetic effects of spectral cues and noise in concurrent speech segregation in early neural transcription is not well understood. Here, we assessed the correspondence between these synergetic effects and subcortical encoding of the speech signal. Our findings indicate that separation and identification of concurrent speech sounds may be debased by a process that integrates the two stimuli in an additive or suppressive manner. Data further reveal that while pitch cues can be used to parse concurrent speech sounds, their effectiveness deteriorates in noise.

MATH & COMPUTER SCIENCE

Characterization and Classification of Gene Expression Data with Sparse Autoencoders

Pulin Agrawal, (Department of Computer Science)

One way to mitigate the curse of dimensionality while performing classification with gene expression data is by utilizing huge amount of publicly available gene expression data. We developed a deep learning mechanism that offers one approach to do this. For the first step we train a sparse autoencoder with these data. To explore biological interpretability of our network, we performed a gene set analysis on each node of the encoding layer of the autoencoder. This provides a data-driven means to characterize and classify gene

expression datasets with a more robust feature set taking full advantage of publicly available data.

Exploring effectiveness of Text categorization techniques in the generation of document fingerprints

Md Mishfaq Ahmed, (Computer Science)

In this presentation, we look into the text categorization techniques that are useful for generating document fingerprints. We generate category vectors from which generate fingerprints and we generate fingerprints based on classical Simhash based approaches then we present our analysis and comparisons.

Initiating language in LIDA: learning the meaning of vervet alarm calls

Nisrine Ait Khayi, (Computer Science)

This presentation is about initiating language in LIDA by using the Learning Intelligent Decision Agent's (LIDA) perceptual learning mechanism to suggest how an infant vervet, *Chlorocebus pygerythrus*, learns the meanings of vervet monkey alarm calls. We consider a multiple meanings approach which includes a feeling-based meaning, an action-based meaning, and a referential meaning. The LIDA agent achieved a good understanding of each of these meanings. This work can be seen as a starting step toward modeling the learning of human language in the LIDA cognitive architecture. Such modeling of language use would be a significant addition to the LIDA model.

A Decision Support Framework for the Internet of Medical Things: Security and Privacy Assessment

Faisal Alsubaei, (Computer Science)

I propose a framework based on a novel taxonomical scenario-based approach to secure Internet of Medical Things (IoMT) environments. The framework recommends scenario-specific assessment criteria that include necessary and sufficient security attributes and based on which proposes rankings for IoMT solutions, providing IoMT stakeholders with the means to measure security in any IoMT scenario to support their decision-making. Finally, it supports the selection of a solution that matches the stakeholder's security goals, which differ depending on the scenario. The novelty of the proposed

assessment framework lies in its ability to adapt to new structures, levels of granularity, extensions, and standards.

Vanishing relaxation time dynamics of the Moore-Gibson-Thompson (MGT) equation arising in high-frequency ultrasound (HFU)

Sutthirut Charoenphon, (Department of Mathematical Sciences)

The MGT equation is a model describing acoustic wave propagation which arises in high-frequency ultrasound (HFU). The dynamic response of MGT depends on the relaxation parameter τ , which accounts for the finite speed of propagation—thus eliminates the so-called infinite speed of propagation paradox. Since τ is relatively small, it is important to trace the dynamics with vanishing parameter $\tau \rightarrow 0$. It is shown that the decay rates for the finite energy are preserved uniformly. The corresponding result provides not only a robust stabilizing mechanism for HFU waves but also leads to a new “higher energy” stability estimates.

Hybrid Location and Connectivity-aware Routing for Connected Vehicles- A Named-Data Networking (NDN) based Approach

Muktadir Chowdhury, Junaid Khan (Computer Science)

Routing or forwarding data packet in Connected Vehicles is a challenging task and data retrieval rate can be very low due to highly dynamic topology and intermittent connectivity. Most of the data forwarding strategies in the literature are location-based accompanied with limited flooding when location information is not available. For efficient communication and data retrieval in the vehicular network, we propose a hybrid forwarding solution that will enable vehicles to choose next-hop based on both the vehicle’s centrality score as well as its location.

A Tutorial Markov Analysis of Effective Human Tutorial Sessions

Nabin Maharjan, (Computer Science)

We investigate what differentiates effective tutorial sessions from less effective sessions. Towards this end, we characterize and explore human tutors’ actions in tutorial dialogue sessions by mapping the tutor-tutee interactions, which are streams of dialogue utterances, into streams of actions, based on the language-as-action theory. Next, we use human expert judgment measures, evidence of learning and evidence of soundness, to identify effective and ineffective sessions. We perform sub-sequence pattern mining to identify sub-sequences of

dialogue modes that discriminate good sessions from bad sessions. We finally use sub-sequence analysis results to generate a tutorial Markov process for effective tutorial sessions.

General-purpose Toolkit for Discovery and Visualization of Heteroplasmy in Cytoplasmic Genomes

Diem-Trang Pham, (Computer Science)

Heteroplasmy, the presence of more than one type of genomes in a cell, has been shown to be associated with several disorders and severe diseases. It is hard and limited to use existing genomic variants prediction tools for heteroplasmy discovery, especially in plant genomes, since these tools do not have an interactive visualization that help researchers explore heteroplasmy sites effectively. We introduced a user-friendly toolkit that aims to help researchers analyze and visualize heteroplasmic sites. The tool computes variant profiles from the alignments, estimates probabilities and scores of heteroplasmic sites, and provides interactive visualization of heteroplasmy candidates across all samples.

Stabilization of Turbulence of Navier Stokes-Equations in Besov and L_p -based Sobolev Spaces

Buddhika Priyasad Sembukutti Liyanage, (Department of Mathematical Sciences)

We consider the 3-dimensional Navier-Stokes equations defined on a bounded domain, initially with no-slip boundary conditions and subject to a force term which may cause turbulence. We then seek to uniformly stabilize the N-S system, either by an internal localized control or else possibly by a localized boundary tangential control. We aimed an explicitly constructed finite-dimensional control. In the 3D boundary tangential case, the finite dimensionality of the control in the Hilbert setting is generally not possible. Then we seek to solve the boundary tangential case in the context of L_p -based Sobolev and Besov spaces, which don't impose compatibility conditions.

PHYSICAL & APPLIED SCIENCES

Uppermost mantle velocity and anisotropy imaging of the Central United states using earthquake data

Urbi Basu, (CENTER FOR EARTHQUAKE RESEARCH AND INFORMATION)

We have obtained P-wave velocity and anisotropy structure of the central United States by performing tomographic inversion of Pn travel times. Prominent regions of high and low velocities are identified at the northern edge of the Mississippi Embayment, at the intersection of two rift systems and in the southwestern portion of the Illinois Basin. Strong Pn anisotropy is observed along the edges of the velocity anomalies. Crustal thickness estimates obtained from Pn station delays indicate progressive crustal thickening towards north.

A Tunable structured illumination system based on a Wollaston prism

Sebastian Bedoya, (EECE)

Experimental verification of a new, cost-effective, incoherent-based tunable frequency structured illumination (SI) system based on a Wollaston prism (WP). A 1D structured pattern is generated splitting an incoherent linear source illuminated by a LED using a Wollaston prism. The study shown the effect of the source's bandwidth on the effective fringes' FOV, and major advantages in the easiness of the period variation and phase shifting without mechanical movements, making the SI setup suitable for a compact structured illumination microscopy system.

Rickettsia proliferation in fleas and ticks on small mammals in different habitat types

Rebecca Butler, (Biology)

Ticks and fleas on small mammals were assessed to determine the presence of rickettsial ompA and gltA proteins in various habitat types. Sherman live traps baited with rolled oats were utilized to capture rodents in hardwood forest, pine forest, and field habitats at the Hobart Ames Plantation, located in Fayette and Hardeman counties, Tennessee. A general linear model was constructed to determine if there is a relationship between habitat types and rickettsia prevalence in ectoparasites on rodents. There was no differentiation among habitat types for the bacterium rickettsia using the detection of ompA and gltA proteins.

Homology Model Template Selection Benchmarking: Global Versus Local Similarity Measures

Paige Castleman, (Chemistry)

Homology modeling provides computational models of proteins with unknown structure by analogy of their sequences to similar proteins. Traditionally, homology modeling template selection is based on global sequence identity, however better models may result from templates with high localized sequence identity. This in silico benchmark study examined performance of global versus local template use for 6 crystallized GPCRs with a long-term goal of optimizing ligand identification efforts. All-atom and alpha-carbon RMSDs of models versus crystal structures were calculated. Data suggests locally weighted templates may provide better models of GPCR ligand binding pocket. Additional evaluations of ligand docking performance are ongoing.

Confirming Quaternary Displacement Rates on the Meeman-Shelby Fault and Joiner Ridge Horst, Eastern Arkansas

Audrey Eason, (Earth Science)

The Meeman-Shelby fault and the Joiner ridge horst are two blind structures in northeastern Arkansas that have no modern seismicity but do have reported Quaternary displacements and are the focus of this research. For this study, cores were collected from the down-thrown sides of both east-bounding faults, where the Quaternary-Eocene contact was at depths of ~55 m and ~36 m, respectively. Sediments from multiple horizons in both cores were sampled for OSL, 14C, and pollen analyses. Slip rates will be calculated by determining the age of the basal alluvium and the amount of displacement associated with these two faults.

Advanced Aerogel Packaging in Unmanned Aerial Systems for Bio-Logistics

Jacob Hadley, (Physics and Materials Science)

Bio-logistics refers to the transportation of temperature and vibration sensitive pharmaceuticals, biological samples, organs and other biological materials. The issue with current bio-logistics methods is the use of bulky packaging and refrigerated coolers designed for biomaterials that are heavy, cost ineffective and pragmatic for transportation of sensitive biomaterials. The proposed solution is the design and optimization of a bio-logistics capsule made with the elastomer PDMS and thin, thermally insulating and mechanically strong polyimide aerogels. The thermal performance of the capsule and the turbulence data due to UAV transportation, monitored by using various MEMS sensors, is presented in this report.

Molecular Detection and Analysis of Exosomes Using Surface-Enhanced Raman Scattering Nanotags and a Miniaturized Device

Elyahb Allie Kwizera, (Chemistry)

Exosomes are 40-200 nm sized vesicles that are shed from every type of cell into an extracellular environment. Recently exosomes have attracted interest due to their potential as cancer biomarkers because they transport molecular contents of the cells from which they originate. Their detection and molecular profiling is technically challenging especially due to their small sizes and environment from which they are found. Here, we report a novel method for exosome detection and protein profiling using Surface Enhanced Raman Scattering (SERS) nanotags in combination with a miniaturized capture platform.

Data-driven Feature Selection for Transcriptomics Data using Singular Value Decomposition

Ted Ling Hu, (Bioinformatics)

The process of feature selection in molecular biomarker discovery involves identifying a subset of representative biomolecules (typically genes) that have high predictive ability for a phenotype in question. One such technique, singular value decomposition (SVD), enables unsupervised feature selection by performing dimensionality reduction. Specifically, SVD reduces data dimensionality by identifying a smaller set of features (eigengenes) that are linear combinations of the original gene features. These eigengenes have been shown to improve biological understanding of high-dimensional gene expression datasets

1-D Shear Wave Velocity and Radial Anisotropy of the Sediments of the Mississippi Embayment

Chunyu Liu, (Center for Earthquake Research and Information)

We applied ambient noise analysis on a small tremor array in the Mississippi embayment. Fundamental-mode Rayleigh and Love waves were observed in the internal-array cross-correlations between 1 and 6 Hz. Synthetic-real dispersion curves matched better for Rayleigh wave than Love wave. The group velocity of Rayleigh wave ranged from 0.25 km/s to 0.3 km/s in the frequency band of 1-6 Hz, while the group velocity of Love wave is about 0.2 km/s. Love-Rayleigh discrepancies may indicate radial negative anisotropy, and the vertical structure like cracks or dikes other than horizontal layers plays an important role on surface wave propagation.

Phosphor-layered silica aerogel as a remote thermal sensing mechanism for material fatigue and failure

Katherine Mitchell, (Physics and Materials Science)

Thermal conductivity is an important property of insulative materials. Mechanical fatigue or failure has the potential to compromise a material's thermal integrity. Current methods of thermal detection are limited by sensitivity, access, and temperature range of operation. Phosphor thermometry is proposed as a superior thermal sensing mechanism due to its high degree of sensitivity, remote access, and wide temperature response range. In this research, aerogel, polydimethylsiloxane (PDMS), and their composites were selected because of their insulative applications, particularly in the aerospace industry, as materials to develop a proof of concept for remote thermal sensing with phosphor thermometry.

The Phase Field Crystal Model: Applications to Dendritic Growth and Ostwald Ripening in Pure Materials

Kyle Moats, (Physics and Materials Science)

The phase field crystal (PFC) model is a conserved continuum model which is used to investigate the phase behavior of materials near the melting point. The simplest PFC model produces a solid phase with a triangular lattice structure. A PFC numerical solver code was implemented and used to study dendritic growth and Ostwald ripening. In the dendritic growth study, the behavior of the growth of solid around a nucleus in a supersaturated solution was investigated. Results of the Ostwald ripening study were compared to microgravity experimental data.

PC 12 Cell Adhesion and Differentiation on Carbon Aerogel Scaffold

Martina Rodriguez Sala, (Department of Physics and Materials Science)

Traumatic injuries to the peripheral nervous system have life changing consequences. Existing techniques do not accomplish total nerve repair, therefore there is a need to keep researching and improving those methods. The design of smart materials can have an important impact on this area. The first step towards achieving this goal is to understand the behavior of neuron-like PC12 cells in vitro on different substrates that have the potential to be transformed into a smart implant. In this case, carbon aerogels are used to understand the behavior of PC-12 cells onto a conductive substrate.

Sourcing the Sacred: Application of Reflectance Spectroscopy to Hopewellian Chert Cache Discs

Brian Rowe, (Earth Sciences)

The accurate assessment of stone material used in the construction of prehistoric tools has been an issue in archaeology from the field's infancy. As source information can be utilized in an effort to map culture group interactions with both the landscape and other groups, accuracy in this regard is critical and serves to create a more holistic understanding of prehistoric social networks and land-use relationships. This study analyzes a sample of chert cache discs from the Crib Mound site in Indiana utilizing reflectance spectroscopy, with the goal of examining these relationships via material source selection.

Development of an affordable automated on site haloacetic acids analyzer

Robyn Snow, (Chemistry)

Haloacetic acids (HAAs) are a class of carcinogenic compounds regulated by the USEPA known as disinfection byproducts. Water treatment plants (WTPs) have a need to analyze and monitor these chemical species. Many methods for HAAs analysis involve the use of expensive instrumentation such as mass spectrometers or fluorescence detectors, which many WTPs do not have access to. There exists a demand for on-site automated instrumentation methods for HAAs as none are currently commercially available. An automated on-site HAAs analyzer has been developed implementing 3D printing and automation through RaspberryPi to bring cost down so that it is commercially feasible.

Mechanical and tribological investigation of thin film coatings onto flexible polymeric substrate

Andrea Vincent, (Physics and Material Science)

Siloxane-based polymers have a high density of surface charge and, typically, a high coefficient of static friction. The former leads to premature clouding and contamination of the surfaces and can compromise the performance of the material, particularly in applications where there is a need for optical access to the bulk material. In this study, I present recent efforts to create a topcoat protective layer that mitigates both issues without adversely affecting the base properties, focusing on investigating the

mechanical and tribological properties of the bilayer system as a function of layer thickness and deposition conditions.

Geologic Mapping of Lake County, Tennessee, the Heart of the New Madrid Seismic Zone

Taylor Weathers, (Earth Sciences (Geology))

The purpose of this project is to develop surface and subsurface geologic maps of Lake County, Tennessee, which lies within the New Madrid seismic zone. This included producing structure contour maps of the tops of the Paleozoic, Cretaceous, and Eocene. A 3D geologic model was produced from the Quaternary to the Paleozoic. The resulting maps and models provide a better understanding of the deformation resulting from the New Madrid seismic zone, which can be used to produce earthquake ground motion and liquefaction potential maps.

SOCIAL AND BEHAVIORAL SCIENCES

Spectral /Cepstral Analyses of Phonation in Parkinson's Disease Before and After Voice Treatment

Ghadah Alharbi, (School of Communication Sciences & Disorders)

This study examined spectral and cepstral analyses derived from sustained vowels produced by nine speakers with Parkinson's Disease (SWPD) before and after intensive voice treatment. Results from the Dysphonia in Speech and Voice (ADSV) program (KayPENTAX, 2011) indicate that CPP, CPP-SD, and CSID improved significantly following LSVT. Increased CPP, which is a measure of the dominance of harmonics in the spectrum, reflected improved harmonic structure following LSVT. However, L/H SR decreased significantly following treatment only after restricting the frequency cutoff to the region just above the first formant and second formant and below the third formant.

Influence of Student's Perceptions on Their Achievement in Top-Performing Confucius Countries

Isbah Ali Farzan, (Counselling, Educational Psychology, and Research)

Chinese-Taipei (Taiwan), Hong-Kong, Japan, Korea, and Singapore are the top-performing countries on international tests of academic achievement. The study explores their thinking by using Eccles and Wigfield's model of expectancy-value theory which explains achievement behavior by expectancies-of-success and subjective-task-values, influenced by factors including self-concept. It uses intrinsic-value,

utility-value, and self-concept to understand achievement behavior. It uses regression-analysis in SPSS on a nationally representative subset of 24,612 grade eight students from Trends-in-International-Mathematics-and-Science Study 2015. Self-concept is the most significant contributor to math achievement. Utility-value contributes positively except in Singapore. The results of the contribution of intrinsic-value are mixed.

Race- and Place-Based Differences in Predictors of Infant Mortality

Anna Church, (Sociology)

Infant mortality, the death of an infant before reaching their first birthday, is one of the most important indicators of a healthy society, as well as a key marker of maternal and child health. In the United States, progress has been made in reducing the overall infant mortality rate, but this reduced aggregated rate can hide marked racial and geographic disparities. The objective of this study is to identify significant predictors of infant mortality at the state-level and to determine how these predictors vary by the race and birth state of the infant.

Language, Persuasion, and Politics: 2016 US Presidential Race to the White House

Danielle Clewley, (Psychology)

How persuasive a candidate is impacts how successful a campaign is. The focus of this research is to understand why some candidates drop out earlier than others and how far to the extreme the outside candidates pull mainstream candidates. I examine persuasive language through the Elaboration Likelihood model and its effectiveness by correlating linguistic dimensions of candidate speeches and campaign durations. I take a qualitative approach by analyzing language over time with emphasis on substantive cut-points. I hypothesize that candidates using the peripheral route to persuasion and candidates with emotive messages will be more successful. Preliminary results support these hypotheses.

Assessing profiles of maladaptive coping strategies following intimate partner violence.

Thomas Dodson, (Psychology)

Latent profile analysis (LPA) was used to examine coping strategies in female domestic violence survivors, focusing on four maladaptive strategies: dissociation (DISS), avoidant problem-solving (APS), alcohol use (AU), and drug use (DU). Profile 1 (Low; n=125) had the lowest values across all maladaptive strategies. Profile 2 (High DISS/APS; n=39) had the highest values for DISS and APS and moderate

values for DU and AU. Profile 3 (High DU/AU; n=71) had moderate values for DISS and APS and the highest values for AU and DU. The current findings highlight treatment targets following domestic violence.

The Social Work Discipline in the Management of Failure to Thrive in Infants and Children

Abigail Durham, (Social Work)

Failure to thrive (FTT) is a ICD-10 diagnosis which describes infants and children who fail to grow within expected norms. The causes for poor growth are multifactorial and often include psychosocial factors. Social workers are important players in an interdisciplinary team approach to this diagnosis. Through this case report, I will address social workers roles in the treatment of FTT, how social work services provide a therapeutic and team-oriented approach, and analyze the cost benefit of treatment of FTT in a Primary Care Facility verse a hospital.

SUBCHRONIC OXYTOCIN ADMINISTRATION ALTERS DOPAMINE RELEASE IN THE NUCLEUS ACCUMBENS OF MICE

Mary Estes, (Psychology)

Clinical studies have shown that oxytocin administration can attenuate addictive behaviors. Drugs of abuse increase mesolimbic dopamine transmission; however, the interaction between oxytocin and dopamine is unclear. The present study used open field testing and in vivo fixed potential amperometry to measure behaviors and dopamine transmission in mice following subchronic oxytocin administration. Results indicated that oxytocin reduced locomotor activity, dopamine release, and dopaminergic response to a psychostimulant. Understanding the neural effects of oxytocin is important given its potential therapeutic uses.

Arachidonoyl Serotonin (AA-5-HT) Modulates Anxiety-Related Behavior and Tunes Mesolimbic Dopamine Transmission in Mice

Timothy Freels, (Psychology)

Cannabinergic signaling is a mechanism of interest for the treatment of anxiety symptoms due to the anxiolytic properties of cannabinoid type 1 receptor (CB1R) activation. We examined the effects of the cannabinoid AA-5-HT on anxiety- and fear-like behaviors in male low and high anxiety mice in tests of anxiety- and fear-related behaviors. Using amperometry, we assessed whether cannabinergic modulation of mesolimbic dopaminergic activity could potentially be involved in the behavioral effects of AA-5-HT administration. Our findings imply that the utility of AA-5-HT as an anxiolytic drug may limited by individual

differences in contextual factors and basal anxiety symptoms in humans.

Genetic influences on distinct forms of impulsivity and cocaine sensitivity

Daniel Gabriel, (Psychology)

Susceptibility to substance abuse disorder is shaped by selective differences in behavior. Understanding the genetic basis of these traits may have utility for identifying and treating vulnerable individuals. To assess if impulsivity and cocaine sensitivity are heritable in a rat model, we measured differences in these phenotypes between near-isogenic rat strains. We found that impulsive action (but not choice) and cocaine induced locomotion were elevated in specific rat substrains, suggesting that these phenotypes have a strong genetic component. These data are the first step in a research program designed to identify the genetic variants underlying addiction-relevant behaviors.

Settler-Colonialism, Apartheid, and the One-State Paradigm: South Africa and Israel Comparative

Dania Helou, (Political Science)

Scholars, activists, and politicians are increasingly utilizing the language of apartheid to describe Israel's practices towards Palestinians and other non-Jewish Israelis in Gaza, West Bank, and Israel proper. This research assesses the claim that Israel applies an apartheid regime towards Palestinians as a whole despite their geographic fragmentation and the feasibility of the two-state solution. I show that the settler-colonial paradigm is fundamental in understanding the legal manifestations of apartheid and historical power asymmetries in Israel-Palestine, which are in part due to the international legal system. I find that the two-state solution is infeasible despite its dominance in negotiations.

Comparing Phasic Dopamine Dynamics in the Striatum, Nucleus Accumbens, and Amygdala

Zade Holloway, (Psychology)

Dopamine is a neuromodulator which regulates heterogeneous neural processes throughout the brain, including emotional processing in the amygdala, reward in the nucleus accumbens, and action-selection in the striatum. The multifunctionality of dopamine likely occurs at the synapses of these systems, with varied amounts of dopamine release acting on different receptor populations. This study provides an examination of dopamine dynamics in 3 neural output regions of the mesolimbic and nigrostriatal pathways using amperometry. An improved understanding of regional differences in dopamine transmission can

lead to increased knowledge about dopaminergic influence on behavior and more efficient treatments for disorders of dopamine dysfunction.

The assemblage of trust: Moderating the effect of trust to predict perceptions of corruption

Bradly Knox, (Communication)

Research on public trust has often looked at the effect of government action on citizen trust. However, this presentation attempts to address a gap in the literature by arguing trust is moderated by underlying factors not originally attributed in prior research. I perform a series of bivariate regressions that highlight an interesting trend with aggregate data: the relationship between trust in government and perceptions of political corruption differs depending on one's party identification, ideology, generation, and race/ethnicity (which I coin as an "assemblage").

Exploring the Relationship Between Therapeutic Alliance Ratings Based on Shorter and Longer Therapy Interactions

Rivian Lewin, (Psychology)

Therapeutic alliance is considered to be a cooperative partnership between a therapist and client within the context of a personal bond. In other areas of psychology, researchers have shown that judgments based on short interactions are highly predictive of judgments based on longer interactions. However, there have been few comparable evaluations of observational ratings based on brief interactions in psychotherapy. In this study, observers rated alliance from 5- or 10-min segments of therapy. Results indicated ratings from the short segments substantially predicted ratings from the long segments, suggesting alliance can be evaluated based on brief interactions.

Reliability of listeners' perception for infant vocal imitation using repeated judgments

Helen Long, (CSD)

Many studies have empirically evaluated whether infant imitation exists from birth. However, to our knowledge no study has assessed the reliability of listener perceptions for vocal imitation in infants. This study utilized segments extracted from naturalistic parent-infant interactions of a parent model followed by an immediate infant utterance. Listeners were instructed to rate how imitative was the

infant utterance compared to the parent model using a rating scale. Inter- and intra-rater reliability scores were analyzed to determine consistency of ratings and salient qualities for vocal imitation in infants below twelve months of age.

Nonmusicians with innate musicality exhibit enhanced neural encoding of speech

Kelsey Mankel, (Communication Sciences and Disorders)

Musicians often exhibit superior auditory encoding of normal and noise-degraded speech within the brain. What remains uncertain is whether this "musician advantage" results from formal musical training itself or innate sensitivities of the auditory system that precede training. We compared neuroelectric responses of musically naïve individuals to speech sounds in quiet and noisy backgrounds. Musicality was assessed objectively via the brief Profile of Music Perception Skills. Innate musicality was associated with enhanced neural encoding of speech at multiple levels in the auditory system. "Musical" individuals also showed improved encoding of degraded speech, consistent with findings reported in highly trained musicians.

Peer Liking and Psychological Inflexibility Mediates the Relation Between Children's Resilience and Loneliness

Samantha Newman, (Psychology)

Resilience, assessed as the availability and use of internal and external resources, can buffer negative life experiences and promote successful adaptation. There is limited research on resilience and loneliness in children. The present study examined liking by peers and psychological inflexibility as mediators of this relation for children (Grades 3 to 5). Resilience significantly related: a) directly (negatively) to feelings of loneliness, and b) indirectly to loneliness as mediated by peer liking (negatively) and psychological inflexibility (positively). Thus, having and using resources, i.e., being resilient, can buffer against children's loneliness directly and by enhancing peer relations and problem solving skills.

Racial Differences in Knowledge Pertaining to Smoking After a Cancer Diagnosis

Kinsey Pebley, (Psychology)

The current study examined racial differences in knowledge about how smoking impacts cancer. All participants in the sample were current smokers with a cancer diagnosis at an oncology clinic in Memphis, TN. Results indicated that African Americans, compared to Caucasians, were significantly more likely to believe that cigarettes can cause cancer and that smoking can contribute to the development of a second cancer. However, African Americans were also more likely to think that quitting smoking after a cancer diagnosis would not help. African Americans may feel more hopeless about their health after a cancer diagnosis compared to Caucasians.

Speech Hesitations During Complex Word Production Are Related to Phonological Processing Skills in Third Graders

Jonathan Rogers, (School of Communication Sciences and Disorders)

Phonological processing is the ability to perceive, remember, and retrieve chunks of speech information. This study explored the relationship between four types of speech hesitations (false starts, prolongations, filled pauses, and unfilled pauses) and phonological processing skills in nineteen third graders' productions of complex real words and nonsense words. We found that hesitation types were predicted by different phonological processing skills. Speech hesitations may indicate how children store and access phonological information in long-term lexical memory and phonological working memory.

Motivating factors underlying methamphetamine initiation behavior: Applicability of the Theory of Planned Behavior

Michael Schmidt, (Public Health)

Methamphetamine is a highly addictive stimulant. Its use can lead to depression, anxiety, and violent behavior. An estimated 50 million people worldwide reported using meth at least once during 2017, yet little is known about why people initiate use. This study's goal was to explore reasons for meth initiation using the Theory of Planned Behavior (TPB). We analyzed 202 anonymous stories submitted to an online support community for meth-involved, employing qualitative software by Dedoose to help identify TPB themes. Findings reveal a comprehensive set of 11 motivating factors underlying initiation behavior and offer insights for developing theoretically informed prevention efforts.

Circular Emotion Regulation Model: A Tool for Early Elementary ER Training

Holly Staggs, (Educational Psychology and Research)

Studies suggest children have improved academic achievement when they are able to regulate their emotions. Emotion regulation, in early elementary is a skill that is often not taught but expected. Teachers need effective models and methods, if they are going to step outside of the normal curriculum and empower the children with this personal skill, without disrupting timelines for academics. To make teaching emotion regulation more accessible and usable for children a circular model may be appropriate. A circular model allows access to and retrieval of emotion regulation tools. A circular model could be easy to teach to elementary students.

Bloody Economy: How Unstable Economy Influenced Civil Wars for the Post Soviet States

Molly Stout, (Political Science)

Unstable economies have been shown to cause several problems within various states. Studies have also shown that economic hardships can be one of the reasons for a civil war to break out. This paper seeks to prove the hypothesis that economic crises were not only one of the main triggers for civil war to break out inside of two former Soviet states: Tajikistan and Georgia, but also were the main reasons for civil war.

The role of posttraumatic cognitions/emotions in the co-occurrence of PTSD, GAD, and depressive disorders

Han Tran, (Psychology)

Posttraumatic stress disorder (PTSD), generalized anxiety disorder (GAD), social anxiety disorder (SAD), and depressive disorders frequently co-occur. Posttraumatic cognitions/emotions were examined as factors that may underlie the co-morbidity of these conditions among survivors of intimate partner violence (IPV). A latent profile analysis was conducted to empirically derive profiles of IPV survivor's endorsed cognitions/emotions. Multinomial logistic regression analyses then examined whether these disorders predicted profile membership. Findings suggest that posttraumatic cognitions/emotions may contribute to the co-occurrence of PTSD, GAD, and depressive disorders, but not SAD. Results highlight the importance of addressing transdiagnostic processes in interventions for trauma survivors with co-morbid conditions.

Evaluation of Peer Social Competence in Relation to Extent of Classroom and Internet Friends

Robert Washington, (Clinical Psychology)

Having friends is important for the adjustment of children and technology has created new ways to establish these relationships. We examined how number of children's classroom/internet friends related to children's popularity, sociability, classroom aggression, cyber aggression, peer optimism, and loneliness, (Grades 3 to 5). Based on a multi-group path analysis, for both boys and girls, loneliness was negatively related to number of classroom friends and positively related to number of internet friends. Gender differences also emerged for number of internet friends. Thus, numbers of traditional vs. cyber friends were related differently to social competence and effects were moderated by gender.

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