Monday March 28

34th Annual Student Research Forum

Poster Presentation

University Center Ballroom

Hosted by the Graduate School, Helen Hardin Honors College and the Graduate Student Association.

For more information, please visit:
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March 28, 2022

Dear Students:

On behalf of the faculty, staff and students of the University of Memphis, I offer my congratulations on your participation in the Annual Student Research Forum. I appreciate your abilities and the effort you put forth in completing thoughtful, well designed, and thorough research studies. It is through inquiry that new discoveries are made and knowledge from those discoveries is shared. I hope you found your experience enlightening and that you continue to make discovery a part of your professional and personal life, no matter your discipline.

The University of Memphis, recently named an R1 institution by the Carnegie Classification of Institutions of Higher Education, focuses on basic and applied research that directly benefits the Memphis and Mid-South region and also reaches beyond our state and local boundaries. Your continued pursuit of research, and the presentation of your results in regional and national forums, brings honor and recognition to the University of Memphis. We are proud that you are a Tiger.

Warm regards,

M. David Rudd
President

March 28, 2022

Dear Student Researchers,

Thank you for contributing to the 34th Annual Student Research Forum. It is our pleasure to attend this event and learn of the interesting research our students are doing. One of the most critical goals of higher education is to encourage intellectual inquiry and critical thinking. Research provides significant hands-on experience in these areas as you've discovered in your own projects. Whether you pursue a research-related career or not, the skills you have learned in carrying out your projects will serve you well. Research skills are valuable life skills in our increasingly information-rich world. The ability to define a question, to collect and organize information relevant to that question, and to evaluate and ultimately use the new knowledge will be useful in many facets of your lives.

Congratulations on your achievements. Your project is a testament of your hard work, determination, perseverance, and commitment, and a monument to the dedication of your faculty mentors. We hope you enjoy this year's research forum and wish you continued success.

Sincerely,

Robin Poston, Ph.D.
Vice Provost and Dean of Graduate School

Melinda Jones, Ph.D.
Director, Helen Hardin Honors College

March 28, 2022

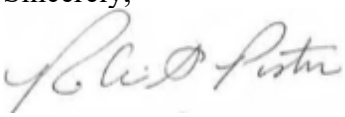
Dear Judges,

On behalf of all those involved in organizing and presenting this year's Student Research Forum, and on behalf of the students participating in this year's event, I'd like to thank all of you for giving so graciously of your time and expertise.

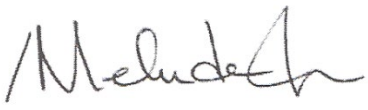
The judges for this forum come from a wide variety of disciplines and scholarly traditions. One of the advantages of an event such as this is the opportunity it provides for students to interact with faculty and gain valuable feedback on their projects. Hopefully this experience will also be beneficial to you by providing you with exposure to the wide range of interests pursued by students at The University of Memphis, and by giving you a preview of the future of your respective fields and disciplines.

Again, thanks to each of you for participating in this year's Student Research Forum. Without your cooperation, support, and enthusiasm, our students would miss a wonderful opportunity to interact with and learn from the highly skilled faculty here at The University of Memphis.

Sincerely,



Robin Poston, Ph.D.
Vice Provost and Dean of Graduate School



Melinda Jones, Ph.D.
Director, Helen Hardin Honors College

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UNDERGRADUATE ABSTRACTS

ENGINEERING

Evaluating Neutrophil Physiological State Upon Template Interaction with Deconvolved Z-Stack Imaging

Hannah Anderson (Biomedical Engineering)

Neutrophils were seeded on electrospun biomaterials (collagen, polydioxanone, gelatin, and fibrinogen) for 3, 6, and 24 hours. Deconvolved z-stack fluorescent images were captured with Olympus BX 63 microscope. Original MATLAB code was used to classify and quantify neutrophil physiological response. Non-parametric statistical analysis showed that collagen electrospun biomaterial caused the least traumatic response and could perform as a competitive alternative to PDO. This research is the first to combine this novel imaging technique with MATLAB to quantify neutrophil states. In future research, larger sample sizes and parametric statistical analysis will produce data to impact the next generation of regeneration templates.

Cytocompatibility of Antimicrobial Silver Coatings on Titanium and Metal Surfaces

Peter Engstrom (Biomedical Engineering)

Silver nanoparticles used in coatings for titanium or other metal devices such as bone and dental implants are effective at preventing infection. However, silver particles released into the body at the implant site can be harmful to cells in the area. However, a novel proprietary method to link silver nanoparticles to chitosan and titanium may slow the release, thereby reducing its harmful effects. The viability of fibroblast cells was measured after being exposed to a chitosan-linked coating on a titanium surface. On average, the viability was found to be lower with the linked coating over a 48-hour period.

Automated Segmentation and Morphological Characterization of Hepatic Steatosis and Correlation with Histopathology

Juan Esparza (Biomedical Engineering)

Prevalence of non-alcoholic fatty liver disease (NAFLD) has increased to 25% of the world population. NAFLD can progress to non-alcoholic steatohepatitis and cirrhosis. NAFLD is assessed with liver biopsy, where pathologists use a bias- susceptible, semi-quantitative fat visual grading system. To our knowledge, no study has described fat droplet (FD) characteristics and their relationship with pathologists' grade to aid understanding of disease progression. In our study, human NASH candidates' liver biopsy FDs were automatically segmented and characterized. FD morphology was modeled with linear and power functions with increasing fat, hence demonstrating morphology might have potential implications for assessing disease progression.

Evaluation of Antimicrobial Coatings Against the Formation of Candida albicans Biofilms

Peyton Freeman (Biomedical Engineering)

Implanted device infections can occur when pathogens form biofilms on the surface. Candida albicans is a common cause for fungal infections. An antimicrobial study was conducted on titanium coupons soaked in either a cis-2-decenoic acid, trans-2-decenoic acid, or 2-cyclopropyl-decenoic acid coating against C. albicans. The solution was incubated for periods of 24, 48, and 72 hours, and planktonic and biofilm viability were measured. As the time of incubation increased, the planktonic average increased while the biofilm average remained the same. The results of this study show that a simple antimicrobial coating on an implant in preventing may prevent fungal infection.

Evaluation of the Effectiveness in a Novel Anti-microbial Against Bacterial Biofilm

Gustavo Jimenez Cienfuegos (Biomedical Engineering)

Infections due to biofilm formation on the surface of implant in orthopedic surgeries can lead to complications and longer recovery time. Studies have shown that biofilm can be difficult to treat because of their antibiotic resistance. For this study, a group of analogs based on benzoic acids were analyzed for their effectiveness to prevent formation of E. coli biofilm. A dispersion assay was performed to analyze the effectiveness of benzoic analogs against E. coli - inhibitions assays will be performed in the future. The results showed that benzoic analogs have some ability to decrease the bacteria growth in E. coli biofilm.

Study of Elution of Antimicrobials from Modified Hydroxyapatite Coatings

Isabella Bianca Reano (Department of Biomedical Engineering)

Hydroxyapatite has applications in bone regeneration and is a natural component of bones and teeth. The purpose of this study is to determine the elution properties and antimicrobial efficacy of modified hydroxyapatite loaded with 2-heptylcyclopropane-1-carboxylic acid (2CP). Release of 2CP and its ability to inhibit bacteria will be evaluated. The first hypothesis is: hydrophobic modified surfaces of hydroxyapatite will extend the release profile of 2CP . To increase its hydrophobicity, carbon chains will be added on to the surface by a silanization reagent. The second hypothesis is that hydroxyapatite coated with 2CP will prevent bacteria (i.e. Staphylococcus aureus) from attaching.

In-vitro Evaluation of Potential Anti-inflammatory Effect of Raspberry Ketone for Guided Bone Regeneration Applications

Samarth Vedante (Biomedical Engineering)

Oral bone defects due to infection, trauma, and periodontitis lead to bone loss. Dental implants, current standard of treatment, often require Guided Bone regeneration (GBR) for proper wound healing. In GBR, clinically placed membranes act as barrier between soft tissue infiltration and defect sites. GBR membranes allow for therapeutic delivery allowing to modulate inflammatory response to aid in healing defects. Raspberry Ketone (RK), naturally occurring phenolic compound, has exhibited potential to modulate macrophage phenotype from pro-inflammatory to anti-inflammatory/pro-healing. This work aimed to evaluate potential anti-inflammatory effect of RK on macrophage polarization of RAW 264.7 cells, macrophage-like murine cell line.

Incorporation Of Elastin Into Electrospun Chitosan Nanofiber Membranes

Ethan Wales (Biomedical Engineering)

Chitosan is a natural polysaccharide used historically for electrospun membranes, in applications such as drug delivery vehicles. Electrospun chitosan is treated to increase hydrophobicity and limit fiber swelling. Elastin is another natural polymer located abundantly in the human extracellular matrix. Incorporation of elastin into chitosan membranes alters the hydrophobic nature of membranes, allowing for water infiltration and increased rate of material degradation. This study evaluates electrospun membranes of differing elastin content, and membrane characteristics including quantitative imaging with scanning electron microscopy, contact angle measurements, tensile testing and a degradation study.

LIBERAL AND FINE ARTS

Germanic Immigrant's Impact on the Expansion of Education in Memphis, 1865-1880

Sophia Rouse (Department of History)

During the mid-nineteenth-century, Germanic people from modern-day Germany and surrounding countries including Austria, Belgium, the Netherlands, Poland, Sweden, and Switzerland integrated into Memphis. By 1865, Germanic emigrants had begun to transform Memphis as their new home. Despite being outnumbered by Irish immigrants, between 1865-1880 through educational involvement, Germanic emigrants involved themselves in the expansion of Memphis. After the Civil War, Memphis transformed their public school system as education-related legislation developed across Tennessee. Germanic Memphians aided in the establishment of public schools and public education in Memphis during the formational years of the Shelby County Board of Education.

LIFE AND HEALTH SCIENCES

Investigating The Causative Gene Of The Chest Blaze Phenotype In American Black Bears (Ursus Americanus).

Caleigh Holley (Biology)

In the bear phylogeny, tropical bear species have prominent blazes, but black bears (Ursus americanus) are polyphenotypic for chest blazes. Domesticated animals are also polyphenotypic for chest blazes. However, this has occurred through selective breeding, whereas it has occurred in black bears naturally. One candidate gene is MITF, which has been found to cause spotting patterns in dog species. Another candidate gene is KIT, which has been found to cause spotting in cat species. There have also been multiple causative genes of spotting found in mice: MITF, KIT, and PAX3 for example.

MAP3K4 Kinase Inactivation Leads to Fetal Growth Restriction in Mouse Embryos

Razan Sweileh (Department of Biological Sciences)

Fetal growth restriction (FGR) is a reduction in fetal genetic growth potential. The leading cause is placental insufficiency. The mother and fetus communicate through the placenta. Kinase Inactivation (KI) of the enzyme MAP3K4 results in lethality prior to weaning. We hypothesized lethality was due to disruptions during gestation. Using microscopy imaging and Adobe Photoshop, we examined mouse conceptuses. We found that KI embryos had reduced embryonic length, liver area, and placental size compared to wild-type embryos. These findings indicate that MAP3K4 controls development, and loss of MAP3K4 activity leads to FGR. Future studies will examine the molecular mechanisms controlling FGR.

Informatic Analysis of Hydrophobic Surface Patches to Guide Design of Water-Soluble G-Protein Coupled Receptor Analogs

Emily Treptow (Chemistry)

G-Protein-Coupled Receptors (GPCR) are structurally-conserved membrane protein receptors involved in most signaling processes. GPCR are targeted by one-third of all drugs. Better understanding of GPCR structures can guide drug discovery. Studies of GPCR are complicated by their hydrophobicity and insolubility in water. A few examples of water-soluble GPCR analogs have been achieved by substituting hydrophilic for hydrophobic amino acid residues. This work expands on this by computing hydrophobic surface patches. Residues found in hydrophobic surface patches are compared as a function of GPCR activation states and bound ligand function. Results from this will inform design of next-generation water-soluble GPCR analogs.

PHYSICAL AND APPLIED SCIENCES

Leg Brightness as an Indicator of Physical Condition in House Finches

Sarah Coleman (Biological Sciences)

In numerous animals, dramatic coloration (e.g., bright red) often indicates potential fitness, but it is less clear whether subtle coloration (e.g., greys) could also encode such signals. To determine if subtle coloration could indicate health in a bird species with colorful feathers, house finches, I quantified leg coloration (greys) during bacterial infection via spectrometry. Birds infected with a virulent pathogen isolate had paler legs than those infected with a mild isolate. Similarly, legs became paler near the peak of infection compared to pre-infection or recovery periods. These results suggest that subtle colors could reliably indicate infection, and therefore survival potential.

Identifying Activity Areas in the Foster Rock Shelter in Alabama

Emily Haff (Earth Sciences - Geo-archaeology)

Identifying activity areas in this site sheds light on the lives of these prehistoric people. It also allows archaeologists to paint a better picture for further analysis. To identify these areas, this project will focus on two factors: artifact density and artifact type. To make the data clear, a full distribution map showing all artifact types will be created to get a good visual of the site and artifact placement. It is important to note that disturbance is possible, so that will also be taken into consideration when making claims based on the distribution map. This project will also begin to discuss the meaning of the placement of the activity areas.

Deciphering Prehistoric Human Migration: Using Reflectance Spectroscopy to Identify Sources of Stone Tools

Christine Smith (Earth Sciences)

Prehistoric artifacts from Clintin, KY are compared with chert samples found to the northeast at the Phelps site near Fredonia, KY and analyzed by using reflectance spectroscopy. The goal was to determine if the sources of the artifacts at the site were associated with the chert from Phelps site outcrop. Early settlements often migrated and used known sources of chert to make stone tools such as hand scrapers, hand axes, spearheads, arrowheads, and drills for everyday use. Over time these tools were reduced due to sharpening and were left behind on their routes.

SOCIAL AND BEHAVIORAL SCIENCES

Examining The Effects Of Oxytocin Administration On Dopamine Release Following Chronic Exposure To Cocaine

Bryn Berretta (Psychology)

Oxytocin is being researched as a possible treatment for psychostimulant use disorder. Our lab previously showed that oxytocin administration decreased the dopaminergic response to cocaine in drug-naïve mice. The present study examined the effects of oxytocin administration on dopamine functioning in mice that have been exposed to chronic cocaine plus a withdrawal period. Cocaine plus withdrawal lead to a reduced dopamine response, which was not altered by oxytocin treatment. These findings conflict with our previous results showing that oxytocin reduces the dopaminergic response to cocaine, indicating that oxytocin does not have the same dopaminergic effect in cocaine-naïve and cocaine-exposed mice.

Impulsive Choice In Two Different Rat Models Of Attention-Deficit/Hyperactivity Disorder: Spontaneously Hypertensive Versus Lphn3 Knockouts

Asiah Bounmy (Psychology)

Impulsivity and hyperactivity are core symptoms of Attention-Deficit Hyperactivity Disorder (ADHD) and have been reported in two different animal models of ADHD - Lphn3-/- (i.e., knockout, KO) rats and Spontaneously Hypertensive Rats (SHRs). This project examined impulsive choice using a delay-discounting task that gave rats the option to press one of two levers for either a delayed (4, 8, 12, or 16 sec) reward of 3 food pellets or an immediate (0 sec) reward of 1 food pellet. Impulsive choice was the tendency to discount the larger, delayed reward.

Oxytocin Administration Alters Exploratory and Anxiety-like Behaviors in Mice

Justice Hagg (Psychology)

Oxytocin Administration Alters Exploratory and Anxiety-like Behaviors in Mice Justice Hagg, Patricia Nalan, Gwendolyn Johnson, Dr. Deranda Lester Department of Psychology The University of Memphis Department of Psychology 400 Innovation Drive Memphis, TN 38152 In this study, we investigated the effects of oxytocin administration on behaviors related to addiction and anxiety in mice. Following oxytocin or saline pretreatments, open field testing was used to measure exploratory behavior (locomotor activity, the distance traveled in the chamber, which positively correlates with drug seeking) and anxiety-like behavior (time spent in the center of the chamber, which negatively correlates with anxiety) before and after an in-test injection of oxytocin or saline.

Cocaine Conditioned Place Preference in an Animal Model of ADHD

Katherine Hidalgo (Psychology)

Substance Use Disorder (SUD) and ADHD are often comorbid. We used a conditioned place preference procedure to assess SUD vulnerability in an animal model of ADHD – Lphn3 knockout (KO) rats. KO and wildtype (WT) rats received repeated pairings of cocaine (10 mg/kg IP) in one context and repeated pairings of saline in another context. WT rats demonstrated increasing locomotor activity to repeated cocaine injections indicative of cocaine sensitization/reinforcement, but KO rats did not. On the final test day, rats chose between the two contexts. WT rats exhibited a trend toward preferring the cocaine-paired context, while KO rats showed no preference for either context.

Effects of Early Life Adversity on Risky Decision Making

Anna Wiener (Psychology)

Decision-making is a process that requires evaluation of costs and benefits in tandem with their past experiences and knowledge affecting evaluations. Often, decisions may be associated with the chance of a consequence rather than a guaranteed one. Early life adversity (ELA) can be one such historic factor included in decision making; it is known to be detrimental to brain development and has been linked to psychopathology. We developed the Risky Decision Making Task (RDT) for rats to investigate specifically into the effects of early stressors on risky decision making.

GRADUATE ABSTRACTS

BUSINESS

The Importance and Performance of Contactless Services and Consumer Presumed Safety During the Pandemic

LeRoy Conway III (Kemmons Wilson School of Hospitality & Resort Management)

Contactless hospitality services have become a major factor in providing a safe environment for consumers during the global pandemic. Recent research in related segments such as hotels showed that safety attributes were ranked high in both importance and performance. Applying the Importance-Performance Analysis to event services, this study proposes that event consumers' perceived safety will be affected by contactless service attributes including meetings, catering, and customer interaction offered by Conference & Event Services. Moreover, the client types (internal and external) are proposed to moderate the effects of service attributes on perceived safety. Findings from this research will provide insight on how other event services consumers value safety when planning events during the pandemic.

Digital Distraction And Audit Trainee Job Performance

Kehinde Ogunade (Accounting)

The rapid growth in information and communication technology has been invaluable to the audit firms but could also contribute to distraction among audit interns. The purpose of this study is to examine whether digital distractions cause interruptions for audit interns during their training and thus reduce their overall performance. We will obtain survey data from audit interns through Amazon Mechanical Turk. Findings contribute to the audit literature by examining impact of ICT related interruptions on audit trainees' work engagement and job performance.

Artificial Intelligence Aversion: A Task Dependent Perspective To Explain This Unwanted Fruit Of Our Labor

Md Jabir Rahman (Business Information and Technology)

Artificial Intelligence has become very popular recently both in academia and industry. It has a high potential to augment human intelligence and ease our life. Studies indicates that people have a mixed opinion about it. Sometimes they accept it enthusiastically, but not always. Here, drawing on extant literature, and relevant theories, we identify key factors responsible for AI aversion, and categorize those into four groups. Second, we develop a research model and discuss relevant hypotheses to explain it. Our results indicate that people differ in their opinions regarding an AI based on the type of work that the AI is supposed to perform. Finally, we discuss implications for research and practices.

The Influence of Virtual Reality on Costumers' Intention to Visit a Destination

Thi Ngoc Tran (Hospitality and Sport Management)

In response to the growing increase in the use of Virtual reality (VR) in the tourism industry, this study examines the factors influencing consumers' behavioral intentions. Particularly, this study focuses on examining three factors to assess the quality of VR: vividness, easy navigation, perceived control of navigation which are significant predictors of arousal, which in turn positively influence costumer's intentions. Moreover, this study examines how pleasure is associated with the visit intentions. This research also examines whether there is a significant difference in the visit intentions by age and gender.

Expanding of Review Readers and Social Concern Impact the Purchase Intention in Pandemic

Ava Valimoghadam Zanjani (Kemmons Wilson School of Hospitality and Resort Management)

The COVID-19 significantly changes consumers' review reading and posting habits. Consumers have more leisure time and are more concerned about their community in Pandemic. The previous study shows that review interaction was up 89% compared with pre-pandemic levels in the early months of the Pandemic. This study proposes that costumer's willingness to post a review is affected by the leisure time provided by COVID-19 and the high sense of responsibility and social concern, which unite people to support the local restaurant, during the Pandemic. Findings from this study will help restaurant marketers leverage positive reviews and manage existing reviews.

EDUCATION

Exploring a Discriminatory Experience of Placing a Bilingual student in an ESL Class

Majed Alsulami (English)

This paper aims to explore a discriminatory experience of a bilingual student who was placed in an ESL class in a public school in Memphis. It attempts to answer two main questions: (1) To what extent can placing bilingual children in ESL classes negatively impact their educational experiences? (2) And what do bilinguals think about placing them in ESL classes in terms of discrimination and racism? The main participant of this study is a Saudi bilingual child.

Preliminary Work on Development and Validation of a Sources of Research Self-Efficacy Scale

Luke Walden, Justine Piontek (Educational Psychology and Research)

With a heavy emphasis on mastery experiences, existing research self-efficacy instruments often include research activities that may not be salient to students engaging in early research experiences. They also do not take into account the other sources of self-efficacy. We are conducting an exploratory sequential mixed-method study to develop and validate a sources of research self-efficacy scale that will measure mastery experiences, vicarious experiences, social persuasion, and emotional response. We present the results of the early strands of the study, including the proposed scale items as well as preliminary findings on their reliability and validity.

ENGINEERING

Artificial Neural Network for Estimation of Local Scour Depth

Ahmed Shakir Ali Ali (Civil Engineering)

Scour around bridge piers is a natural phenomenon, and it happens due to the stream's flow which erodes the bed material of the river. Besides, the scour is a common cause for bridges collapsing, especially during flood events. Therefore, a precise estimation of scour depth around bridge piers can increase the efficiency of designing for the pier's foundation. One of the approaches for estimating scour is an artificial neural network that can provide accurate estimation, and it was used to predict the scour depth based on the experimental data for this study.

Investigating the Presence of Microplastics in Urban Stormwater Detention Ponds

Muhammad Masood Ashiq (Civil Engineering)

Microplastic (MP) accumulation adversely affects ecosystems by altering the environmental services and entering the food chain. Urban stormwater is one of the most critical sources of MP pollution. Thus, stormwater detention ponds can act as sinks for MP pollution. Studying MP accumulated in the soil of detention ponds can provide valuable information about the level of contamination, type, and sources of MP. In this study, 21 soil samples were collected from two ponds. The level of contamination and MP types were quantified using fluorescent microscopy, hot needle test, image analyses, and Fourier transform infrared spectroscopy (FTIR) analyses.

A Seismological Method For Estimating The Long-Period Transition Period TL In The Seismic Building Code

Christie Assadollahi (Civil Engineering)

Many changes have been made to the design response spectrum used in structural design. One item that has not been investigated since it was first developed is the long-period transition period parameter, TL. The parameter marks the transition from the constant velocity to the constant displacement segments of the response spectrum. The estimation of TL used in engineering design is loosely based on a correlation between moment magnitude Mw and TL that does not account for stress drop $\Delta\sigma$ or the source velocity β. This study aims to include both $\Delta\sigma$ and β in its estimation of TL.

Plastic Fragmentation under Abrasive Wear Forces, An Implication for Agricultural Plastics' Degradation through the Soil

Linkon Bhattacharjee, Maryam Salehi (Civil Engineering)

The application of agricultural plastic products is increasing due to their economic benefits and better-quality harvesting. However, some plastic residuals remain in the agricultural soil which expose to solar radiation, mechanical abrasion, and microbial organisms, potentially leading to their disintegration into smaller particles called microplastics. This study aims to better understand the factors influencing the fragmentation of low density polyethylene (LDPE) pellets and films through abrasive wear forces. For this purpose, an innovative apparatus was made to abrade the plastic surface using sandpaper under different loadings and abrasion ratios. Furthermore, fragmentation behavior of UVA photodegraded LDPE pellets and films were compared to the new samples.

Investigating The Photodegradation Behavior Of Microplastics Present In The Agricultural Fields

Gholamreza Bonyadinejad, Maryam Salehi (Civil Engineering)

Although, application of agricultural plastic products increasing due to their economic benefits in providing an early and better-quality harvest, their residuals in farmlands may fragment to micron-size or even smaller particles. Microplastics (MPs) which are classified in the size range of 100 nm to 5mm, may eventually affect the soil health. Degradation of plastics may cause them to be more brittle, polar and hydrophilic, which, enhances heavy metals uptake consequently. Formation of a variety of polar functional groups (>C-O<, >C=O, >COO) on Low Density Polyethylene (LDPE) can provide nucleation sites for Lead (Pb) and other heavy metals species deposition onto the photo-degraded LDPE.

Impact of Fat Droplet Sizes on R2* in Fat-Iron-MRI Phantoms Emulating Hepatic Steatosis and Hemochromatosis

Sarah Brasher (Biomedical Engineering)

In quantitative MRI, R2* correction is necessary for improving the accuracy of fat fraction quantification in assessing steatosis. However, the dephasing effects of concurrent iron overload may be dependent on the size of iron and fat particles. In this study, we controlled the size of fat droplets in fat-iron emulsion phantoms by traditional stir bar and homogenization methods. R2* and fat fraction (FF) values were estimated with multi-spectral models that assume a common or independent R2* for water and fat. Our results show that R2* was slightly reduced in homogenized phantoms at higher fat fractions compared to stir bar phantoms.

Improving Flood Forecast Accuracy By A New Urbanization Index That Incorporates Hydrologic Connectivity

Francesco Dell'Aira (Civil Engineering)

Flood estimation is crucial in the design of hydraulic infrastructure (e.g., stormwater sewers, dams). Flood forecasts can be based on meteorological data and basin characteristics when real-time streamflow data are unavailable. Land-use, especially the level of urbanization (LoU), has a strong influence on flood generation. Typically, percentage of urban areas is used as a proxy for LoU, even though this ignores how impervious zones are hydrologically interconnected with each other and the stream network. We propose a new GIS-based urbanization index that considers the hydrologic connectivity across portions of land and show that it benefits flood forecasts.

Extended Schools Closure and Threats to the Water Safety, A Case Study in Tennessee

Shima Ghoochani (Engineering Science)

The unprecedented COVID-19 pandemic has forced many governments to implement strict restrictions such as closing the schools, aiming to limit the spreading of the disease. This school closure has ranged from a few weeks to several months and resulted in prolonged stagnation of water within the school's plumbing. In U.S. schools, lead presence within tap water is prevalent and created lots of concerns regarding the impacts on children's health. Thus, this research was conducted to identify how lead levels in schools' potable systems vary due to the long-term stagnation of water in plumbing as the schools were closed under COVID-19 pandemic conditions.

Aging Of Plastic Potable Water Plumbing Materials And Its Impacts On Heavy Metal's Accumulation

Md Hadiuzzaman, Maryam Salehi (Civil Engineering)

The global demand for plastic pipes has been estimated to grow by more than 4% per annum. With increased demand and installation of plastic piping materials for potable water systems, immediate research is essential to understand how the surface oxidation of plastic plumbing materials caused by exposure to the chlorinated hot water influence their heavy metals contaminant transport behavior. Thus, this research is conducted to (1) better understand the surface chemistry alteration of crosslinked polyethylene-A (PEX-A) and high-density polyethylene (HDPE) pipes due to the accelerated degradation by chlorinated water and (2) examine the physicochemical interaction of aged pipes with the lead species present within the synthetic tap water though adsorption isotherms and kinetics experiments.

Developing An Empirical Relationship Between Different Distances Metrics For Seismic Hazard Assessment

Melish Kayastha (Department of Civil Engineering)

The seismic hazard of an area is determined based on the ground motion observed at that site. The intensity of the ground motion can be predicted using Ground motion models (GMMs). These equations are generally developed based on the rupture model, which uses distances such as Joyner-Boore distance (RJB) and Rupture distance (RRUP). However, Probabilistic Seismic Hazard Analysis (PSHA) utilizes point-source based distances like Epicentral distance (REPI) and Hypo-central distance (RHYP), where the fault geometry may not be known. To obtain an accurate seismic hazard of an area, we need to determine the relationship between the distance metrics from these two different models.

Simulation of a Virtual Liver Iron-overload Model and Estimation of R2* Using Complex Fat-Water Models

Prasiddhi Neupane (Biomedical Engineering)

Multi-spectral fat-water-R2* modeling techniques fit either a single R2* or estimate independent R2* for water and fat molecules. In this study, a virtual liver model with hepatic iron overload was created based on true histological data and MRI signals were synthesized using Monte Carlo simulations. The results demonstrate that the dual R2* values predicted by the ARMA model exhibit relaxivity behavior similar to in vivo and thus can be used for R2* estimation in vivo in varying concentrations of iron overload.

Equitable Distribution of Freight Transportation: A Case Study in Tennessee

Mitra Salehi Esfandarani (Civil Engineering)

Transportation policies can sometimes reinforce ethnic, racial, and disability disparities amongst various localities. To address this issue, transportation equity analysis investigates the fairness of impact distribution from transportation planning and analyzes that a certain community experiences a smaller share of the benefits or greater burden of the harms. In this study we focus on social equity and examined the relationship between the freight traffic and disadvantaged communities and provide an analysis of negative impact from freight activity in rural/suburban areas to help decision-makers identify the extent of this impact in multiple contexts.

LIBERAL AND FINE ARTS

An Intervention Study to Promote EFL Students' Coherence and Cohesion In Writing Through Post-Method Pedagogy

Bakheet Almatrafi (English)

Cohesion and coherence play a pivotal role in the quality of writing. The former refers to the meaningful connection between two elements in a text, while the latter is the overall unity and clarity of ideas and text. Arab learners of English face difficulty with cohesion and coherence in their English writing due to L1 transfer. This study evaluated the efficacy of a coherence and cohesion pedagogical intervention based on post-method pedagogy of two groups (treatment and control) of 33 first-year university students. The results revealed that the treatment group's use of cohesion and coherence improved significantly in their writing.

Healing Both Landscape And Body Through The Power Of Architecture.

Isaac Barrantes (Department of Architecture)

This study uses architecture as a tool to mend, rehabilitate, and celebrate patients who are fighting cancer. In this context, mending is focused on the enhancement of spiritual, mental, and physical well-being. This study also focuses on the remediation of a forgotten and historical site and its potential qualities that will activate change in the community. Both patient and site share a similar malignant disease that requires immediate healing. Infusing both with hope, therapy, and support can bring forth a brighter future. With the help of a new healing environment immunocompromised patients can feel protected, nurtured, relaxed and tranquil as they continue their fight against cancer.

Development And Validation Of A Scale Assessing Teaching Artists' Self-Efficacy Of Entrepreneurial Competence

Cordara Harper (Rudi E. Scheidt School Of Music)

There has been a great demand for teaching artists to possess entrepreneurial skills in an era of rapid change and increased focus on 21st-century skills. This pilot study examined teaching artists' self-efficacy related to their entrepreneurial competence. The focus of this presentation is to describe the steps used to develop and validate the instrument used. The survey instrument resulted from the recommendations of an expert panel (N = 3) after conducting Lawshes' Content Validity Ratio for all fifty items. The resulting instrument addresses the extent to which teaching artists feel limited by inadequacy in entrepreneurial skills.

Architecture - An Unmeasured Experience of Space (Building That teach)

Md Shahdatul Islam (Department of Architecture)

Architecture is a physical product of culture that varies with place and time. It performs as a social background and impacts the behavioral pattern of communities. I believe architecture is the third skin for us, human; and it is very important for us to understand its characteristics. For this capstone project, I am proposing a Center for Architecture in Memphis, which will engage and encourage people to visit and learn about the appealing and purposeful influences of this phenomenal art. This research will investigate the relationship between human and environment through architectural forms, geometry, and materiality.

Peripheral Technologies to Geographic Information Systems, the impact of cross-training the workforce

Ashtan Rodgers (Earth Science)

Students leaving academia for professional work benefit from having exposure to many facets of their field of study. This proposed course teaches the basics of programs which are not considered essential to Geographic Information Systems but are often requested in job descriptions for GIS positions. This course introduces students to three GIS-adjacent programs which could help them land a first job or shorten the learning curve of a new profession. A survey was conducted of professionals in the field to understand the impact of these technologies and their market in the workforce.

Makerspace: Creating a Visceral Human Connection in Contemporary Architecture by Expressing Hand Manipulated Materials

Melissa Thielemier (Architecture)

The design research of the makerspace focuses on material expression through maximizing the functionality of clay, metal, and wood. These three materials are natural and hand manipulated with a history of craft and detail. This space restores a lost connection in our digital world by creating a haptic connection in the building. The materials are showcased through the seeing of the making as well as experienced through being immersed in the architecture. A contemporary building, by expressing materials, can restore a visceral human connection to our surroundings.

LIFE AND HEALTH SCIENCES

Contamination And Health Risks Of Polycyclic Aromatic Hydrocarbons In The Soil In Memphis

Namuun Batbaatar (School of Public Health)

This study aimed to evaluate soil contamination of polycyclic aromatic hydrocarbons (PAHs) and the health impacts in Memphis. Soil samples were collected at 50 sites in Memphis and analyzed for 16 priority PAHs. The total PAH concentration averaged 7.6 mg/kg (range 1.5[]98.8 mg/kg), and fluoranthene (average = 1.5 mg/kg) was the most abundant PAH. Diagnostic ratio analysis indicated that soil PAHs originated from traffic sources, including gasoline and diesel combustions. All the PAHs had levels below the residential screening levels except for benzo(a)pyrene. Soil PAHs in Memphis poses nontrivial health risks, and the controls should target traffic sources.

The Familiarity of Background Music Modulates the Cortical Tracking of Speech at the Cocktail Party

Jane Brown (Communication Sciences and Disorders)

The cocktail party problem – how a listener can perceive speech in a noisy environment – is typically studied using speech (multi-talker babble) or noise maskers. However, realistic "cocktail party" scenarios often include background music (e.g., coffee shops, concerts). Studies investigating background music on concurrent speech perception utilize solely instrumental music or synthetic "music-shaped noise," which, though more controlled, do not reflect naturalistic listening environments. Previous work from our lab shows that familiar background music, as well as songs with vocals/lyrics, inhibit concurrent speech recognition. The goal of the current study is to expand on these findings by investigating the neural bases of these effects.

Exogenous And Endogenous Lactate Suppresses Immunometabolic And Inflammatory Responses In Monocytes

Kierstin Davis (Health Sciences)

Many diseases are preventable through regular exercise. However, high-intensity exercise can transiently suppress immune function. Lactate can decrease inflammatory responses through epigenetic modifications such as histone lactylation, inhibiting inflammatory genes while promoting anti-inflammatory genes. Human blood monocytes were isolated and pre-treated with either media or sodium lactate (10mM) for 6 hrs. Extracellular acidification rate (ECAR), oxygen consumption rate (OCR), lactyllysine levels were measured as well as expression of IL10 and TNF. ECAR and TNF were suppressed in lactate treated monocytes while OCR and IL10 were increased. Western blots showed an increase in lactylation in lactate treated groups.

Hydrophobic Surface Patch Disruption to Produce Water-Soluble G-Protein Coupled Receptor Analogs

Christy Dyer (Chemistry)

G-Protein-Coupled Receptors (GPCR) are membrane proteins involved in cellular signaling processes. GPCR are significant pharmaceutical targets. Studying membrane proteins is complicated by their hydrophobicity. Recent studies show proof of principle for water-soluble GPCR analogs by substitution of hydrophobic by hydrophilic amino acid residues. In this study, class-wide and receptor-specific strategies are being developed as approaches transferable to larger numbers of class A GPCR. Experimental assessment of substitution strategies is in progress using the dopamine receptor 2 and cannabinoid receptor 1. Work detailing expression and purification of GPCR analogs containing a folding-reporter fusion protein, emerald green fluorescent protein, will be discussed.

Movie goers Buying Habits During a Pandemic: The Influence of Honesty, Loyalty, and Risk Awareness

Larry Etter (Kemmons Wilson School of Hospitality and Resort Management)

This study looks to discover the buying habits of movie goers during a pandemic. It considers factors such as honesty, loyalty and risk awareness of movie patrons. Do movie patrons smuggle less food into theatres when there is a pandemic? A mixed method approach was used to clarify why concession sales nearly doubled per capita during the pandemic. Attendance was restricted, ticket sales reduced, film selections reduced and concession prices lowered; however, quantitative data shows revenues increased by nearly 100% in some cases. The qualitative data supports the movie goers purchasing habits.

Predicting Unhealthy Nutritional Status For Ever-Married Women From Their Socioeconomic Features: A Machine Learning Approach

Md Mohsan Khudri, Kang Keun Rhee (Economics)

In all its forms, malnutrition imposes enormous costs resulting from economic growth forgone, increased health care costs, and lost investments in human capital. In this study, we find that socioeconomic features such as socioeconomic status and education play a key role in predicting body mass index and risks associated with underweight, overweight, and obesity using supervised machine learning methods.. The findings from this study will have implications for designing appropriate health service policies, diminishing the burden of malnutrition in women, and achieving important targets such as Sustainable Development Goals.

Children With Amblyaudia Show Less Flexibility In Auditory Cortical Entrainment To Periodic Non-Speech Sounds

Sara Momtaz (Communication Sciences and Disorders (CSD))

Objective: We investigated auditory temporal processing in children with amblyaudia (AMB), a subtype of auditory processing disorder, via cortical neural entrainment. Design and study samples: Evoked responses were recorded to click-trains at slow vs. fast (8.5 vs. 14.9/sec) rates in n=14 children with AMB and n=11 age-matched controls. Source and time-frequency analyses decomposed EEGs into oscillations (reflecting neural entrainment) stemming from the bilateral auditory cortex. Results: Phase-locking strength in AMB depended critically on the speed of auditory stimuli. In contrast to age-matched peers, AMB responses were largely insensitive to rate manipulations. This rate resistance was seen regardless of the ear of presentation and in both cortical hemispheres.

Sexual Dimorphism in Response to Diet and Impact on Obesity and Metabolic Syndrome

Zereque Powell (College of Health Sciences)

Presently it is known that there are different metabolic mechanisms that induce metabolic syndrome in males more often than females until late age. To explain how diet factors into this increase in metabolic syndrome in males, mice were placed on either a control, high-fat, or high-sugar diet for 6 weeks. The male mice placed on the high fat diet displayed increases in body weight, fat mass and demonstrated glucose intolerance. In the female group, there was no difference in these variables in the three different diets.

MATH AND COMPUTER SCIENCES

Numerical Index of Banach Spaces, specially L_p spaces for p between 1 and infinity

Monika (Department of Mathematical Sciences)

Numerical index of a Banach space is a number relating the norm and the numerical range of a bounded linear operator. The problem of computing the numerical index of the L_p-spaces has been latent since the beginning of the theory. The result presented will throw some light on this long standing problem and it is the best known so far.

Fluid–Structure Interaction with Kelvin–Voigt Damping: Analyticity, Spectral Analysis, Exponential Decay

Rasika Mahawattege (Department of Mathematical Sciences)

We consider a fluid–structure interaction model defined on a doughnut-like domain. It consists of the dynamic Stokes equations evolving on the exterior sub-domain, coupled with an elastic structure occupying the interior sub-domain. A key factor—a novelty over past literature—is that the structure equation includes a strong (viscoelastic) damping term of Kelvin–Voigt type at the interior. This affects the boundary conditions at the interface between the two media and accounts for a highly unbounded "perturbation". Results include: (i) analyticity of s.c semigroup of contractions defining the overall coupled system, (ii) its (uniform) exponential decay, along with (iii) sharp spectral properties of its generator. Some results are geometry-dependant.

Grid Method For Divergence Of Averages Along The Subsequence $(\Sqrt N)$

Sovanlal Mondal (Mathematical Sciences)

It is known that the Cesaro averages along $(\sqrt n)$ do not converge. However, the oscillation behavior of the averages were not clear for a long time. I proved that it actually oscillates in the worst possible way. In my presentation, with the help of some picture, I will explain the behavior of the averages along $(\sqrt n)$ and the technique of the proof.

Predict The Top Players From A Cricket Match Using Data Science Models(Machine Learning And AI)

Pravallika Pasala, Sai Lakshman Sakhamuri (Data Science)

In this project, we are going to predict the top 11 players from a cricket match Where we will use the Machine learning models using Point based systems to predict the outcomes.This models helps us to predict top players from any type of sport. Here we are demonstrating with Cricket sport as an example.

Long-Term Dynamics For A Semilinear Wave Equation Subject To Nonlinear Boundary Dissipation

Madhumita Roy (Mathematics)

In this talk we shall consider a wave model in 3D on a bounded domain which contains nonlinear sources and nonlinear feedback dissipation. Similar models with simpler nonlinear boundary terms have been already studied broadly whereas the generosity of our model is not only the presence of nonlinear damping but also nonlinear boundary source, which makes the problem heavily nonlinear and even more realistic.

PHYSICAL AND APPLIED SCIENCES

Construction Of Quantitative Structural-Activity Relationship Models For Predicting Biological Activity Of Novel Antibiofilm Agents

Hayden Criswell (Chemistry)

Bacterial Biofilms are organized bacterial microcolonies that can accumulate on living or extracellular surfaces. Biofilms are responsible for 77% of burn wound mortalities and an estimated cost of $450 million annually. A method that can be used to combat biofilms is the prediction of biological activity of novel antibiofilm molecules using Quantitative Structural-Activity Relationship (QSAR) models developed from known antibiofilm molecules. QSAR models are used to establish a correlation between biological activity and molecular structural features. The models generated in this work exhibited acceptable fits to their training sets but were not sufficiently predictive to apply in drug development applications.

Moho Depth Evaluation Using GOCE Satellite Data And Least Square Collocation Method

Hadi Heydarizadeh Shali (Center for Earthquake Research and Information (CERI))

The so-called Mohorovičić discontinuity (or Moho) is the interface between mantle and crust of the Earth and its determination is important for plate tectonics, earthquake mechanism, etc. While lithology and seismic methods suffer for sparsity and non-homogeneous spatial coverage data due to high costs of acquisition, the use of satellite gravity data like GOCE mission is a valid alternative. In this work, the Moho surface is mapped based on gravity data by considering a simplified model of the Earth. Results are comparable and show that inverting satellite data to understand what is happening beneath the earth is worthwhile.

Synthesis Of Novel Diffusible Signaling Factors, For Determination Of Structure Activity Relationships And Structural Stability.

Brian Hoffman (Chemistry)

Biofilms pose a significant threat to public health with the National Institutes of Health finding that biofilms are associated with 65 to 80% of hospital-related infections. Diffusible signaling factors (DSF) are a family of compounds that regulate biofilm formation/degradation. Cis-2-decenoic acid (C2DA) is an active DSF compound, dispersing both gram-negative and gram-positive bacteria. The cis-alkene of C2DA can isomerize or degrade causing loss of function. 2-heptylcyclopropyl-1-carboxylic acid (2CP) is a stabilized version of C2DA with comparable biological activity. Herein we will describe methodologies developed for the analysis DSF of structural stability and the synthesis of novel DSF agents.

Periodic Nanohole Arrays With Enhanced Lasing And Spontaneous Emissions For Low-Cost Plasmonic Devices

Bryson Krause (Physics and Material Science)

Periodic arrays of air nanoholes in thin metal films that support surface plasmon resonances can provide an alternative approach for boosting the light–matter interactions at the nanoscale. Here, we employ a simple technique to fabricate nanohole arrays and examine their photonic applications including enhanced lasing and spontaneous emission of novel nanomaterials. Through spectral and temporal characterizations, it was shown that these arrays offer an enhancement in the lasing emission of an organic dye liquid gain medium with a quality factor above 150 as well as an accelerated decay rate for CdSe quantum dots.

Using Deep Learning To Predict Time-Dependent Temperature Field For 2d Mantle Convection

Ryann Lam (CERI)

We'd like to assess the capabilities of deep learning to generate time-reversed sequences for mantle convection, a complex, temperature-dependent process. Numerical models are frequently used to investigate mantle convection but are restricted to forward modeling. Here, we use the numerical solver ASPECT to generate data sets for a simplistic case featuring a rising spherical anomaly in a homogeneous mantle. We train LSTMs, well-known for their suitability for time series forecasting, using temperature fields from these simulations. We present our results for forward prediction of temperature fields for some initial thermal state. Future work will be to predict the initial state.

Developing a Novel Framework for Structure-based Pharmacophore Model Generation and Selection

Gregory Szwabowski (Chemistry)

Pharmacophore models are three-dimensional arrangements of molecular features required for biological activity that are used in ligand identification efforts for many biological targets, including G protein-coupled receptors (GPCR). Though GPCR are integral membrane proteins of considerable interest as targets for drug development, many of these receptors lack known ligands or experimentally determined structures necessary for either ligand- or structure-based pharmacophore model generation. As an alternative, we have developed a structure-based pharmacophore modeling protocol that is applicable to any GPCR structure (experimental or modeled). Furthermore, we have addressed the oft-neglected topic of pharmacophore model selection via development of machine learning classifiers. Progress to date will be discussed.

Synthesis And Stereochemical Characterization Of Novel Diffusible Signal Factor 2-Heptylcyclopropyl-1-Carboxylic Acid For Antibiofilm Action

Rachel Wiley (Chemistry)

Biofilms consist of bacteria and bacterial-derived biomolecules and contribute to microbial antibiotic resistance. Formation and dispersal of biofilms is regulated, in part, by diffusible signal factors (DSF). One highly studied DSF is cis-2-decenoic acid (C2DA) which disperses biofilms and prevents their formation. We have synthesized a chemically stabilized C2DA analog, 2-heptylcyclopropane-1-carboxylic acid (2CP), which replaces the cis-alkene with a more stable cis-cyclopropyl group. This results in two enantiomers that could have different magnitudes of biological activity. Herein we describe work towards the synthesis and characterization of each 2CP enantiomer for antibiofilm testing.

SOCIAL AND BEHAVIORAL SCIENCES

Auditory Erps In A Genetic And Phenotypic Animal Model Of Adhd – Evidence Of Inattention

Logan Brewer (Department of Psychology)

In humans, individuals with attention-deficit/hyperactivity disorder (ADHD) have been found to have a reduced N1 response to salient sound stimuli. We assessed auditory ERPs (P1-N1-P2-N2) in both a genetic (Lphn3 knockouts, KO/wildtype, WT) and a phenotypic model (Spontaneously Hypertensive Rat, SHR/Wistar-Kyoto, WKY) of ADHD. Electroencephalographs (EEGs) were recorded using subdermal needle electrodes while freely-moving rats were presented 5-tone trains with varying short (1-s) and long (5-s) inter-train intervals (ITIs). Although KOs and WTs did not demonstrate any meaningful differences, SHRs had a significantly reduced P1 and P1N1 response relative to all other lines, reflecting possible analogous deficits in automatic attention.

Development and Validation of the 4-item Self Care Inventory

Vinkrya Ellison (Psychology)

Diabetes If not managed properly, glycemic control will be affected, resulting in serious complications. Adherence for following a diet medical regimen is important to minimize some of the health impacts that this disease has. Quick and rapid assessment of adherence is important, yet few establish measures exist. Therefore the purpose of this study is to validate a 4-item Self Care Inventory measures of adherence. The agenda of the study is to find a brief questionnaire that could be administered quickly in a clinic and have good psychometrics that correlated strongly with Hemoglobin A1c.

Evaluating Bias and Equitable Assessment of the PedsQL-SF Among Income and Racially Diverse Youth T1D

Kasey Harry (Psychology)

The purpose of this study is to explore the measurement invariance of the Pediatric Quality of Life Inventory- Diabetes Mellitus Version 3.2 (PedsQL-DMSF5) across racialized categories, genders, median HbA1c, age, illness duration, and income. Methods: 180 youth with T1D and their caregivers completed the PedsQL-DMSF5 and PedsQL-DM full version. Confirmatory Factor Analyses (CFAs) and correlations were conducted in Mplus. Results: Invariance was supported for: HbA1c, age, illness duration, gender, and median income, found to be reliable and valid. Conclusions: The PedsQL-DMSF5 may be a useful, brief, and unbiased measure of Health-Related Quality of Life for youth with T1D and their families.

A Tool For "Keeping It Maximal" With Linear Mixed-Effects Models

John Hollander (Psychology)

Linear mixed-effects models are widespread in psychological research because they can accommodate nested and longitudinal designs through the incorporation of random effects. Best-practice guidelines have identified a few valid approaches to building, selecting, and reporting them. Perhaps the most popular of these is the "keep it maximal" approach, which recommends using the maximal random effects structure justified by one's experimental design. However, constructing and selecting maximal models can be computationally and programmatically challenging. This poster will provide an overview and validation of a new, forthcoming tool for researchers who wish to automate model construction using the maximal approach.

Decision Making Factors Impacting Sound Acceptability by Young Typical Hearers

Rachel Huber (Communication Sciences & Disorders)

Standard audiological evaluations don't determine how a person accepts amplified sound. This research aims to evaluate factors that listeners consider when determining sound acceptability. 53 typical-hearing young-adults participated in this descriptive survey study. Multi-dimensional scaling (MDS) plots were examined for trends in two dimensions. The first dimension was grouped by loudness, and participant clusters supported this interpretation. The second dimension had no initial trends; however, t-tests suggest that differences existed between two second-dimension groups' age, emotionality, and their episodic single-sound ratings. While results suggest participants used several factors when judging sound acceptability, it's unclear if hearing-aid wearers use these factors.

Decision Making Factors Impacting Sound Acceptability Judgements by Young Typical Hearers

Rachel Huber (Communication Sciences and Disorders)

Standard audiological evaluations don't determine how a person makes judgments about sound. This research aims to evaluate factors that listeners consider when determining sound acceptability. 53 typical-hearing young-adults participated in this descriptive-survey study. Multi-dimensional scaling (MDS) plots were examined for trends in two dimensions. The first dimension was grouped by loudness, and participant clusters supported this interpretation. The second dimension had no initial trends; however, t-tests suggest that differences existed between two second-dimension groups' age, emotionality, and their episodic single-sound ratings. While results suggest participants used several factors when judging sound acceptability, it's unclear if hearing-aid wearers use these factors.

Speech Perception with Facemasks in Individuals who are Hard of Hearing

Brooke Larson (School of Communication Sciences and Disorders)

As the world continues to navigate mask mandates, those with hearing loss may have additional difficulties understanding speech through a mask. This study provides information on how different types of face masks affect speech perception performance and listening effort in those who are hard of hearing. This research will help guide decisions about which facemasks are appropriate to wear to maximize speech perception. Results showed significant differences in speech perception performance and listening effort were observed using different types of facemasks.

Orbitofrontal Cortex and Basolateral Amygdala Regulate Decision-making Guided by Delayed vs. Immediate Punishment

Anna Liley (Psychology)

Under-valuating negative consequences can lead to detrimental outcomes, especially since real-world punishment often occurs after a decision is made. The Delayed Punishment Decision-making Task (DPDT) reveals that rats avoid rewards associated with immediate punishment but increase choice of the same rewards/punishments when punishment is delayed. Therefore, as in humans, rats underestimate, or "discount", delayed punishment. Here, we investigated the role of lateral orbitofrontal cortex (lOFC) and basolateral amygdala (BLA) in the discounting of delayed punishment. Male and female rats were trained in DPDT with either ascending or descending delays, then lOFC or BLA were pharmacologically inactivated prior to task performance.

What Is Healthy Fast Food? Defining Healthy Food In The Fast-Food Industry

Monsurat Moruf (Kemmons Wilson School of Hospitality and Resort Management)

The emergence of fast food in American society has handled the dawn of the new age where people screwed for more comfort as they have kept the emergence jet age more than organization. Going into the 21st-century fast food was being asserted with a lot of diseases (i.e., cardiovascular disease). In order to not lose and keep within the changes of society like the pandemic, fast food organizations like McDonald's had to add healthy meals (e.g., grilled chicken sandwiches, and veggie burgers) and pay more attention to descriptions on the menu. The purpose of the study is to examine how consumers define healthy fast food.

Association Of Health Outcomes And Health Behaviors With Religious Belief: Population-Based Findings From Syria

Ayesha Mukhopadhyay, Tony Lugemwa (School of Public Health)

Muslims often have worse health than Christians in Christian-majority countries. This study compared health outcomes and behaviors in a population-based, representative sample of 2038 Muslims and Christians (55% women; mean age 35.3 years; 5% Christian) in predominantly Muslim Syria. Participants self-reported several health conditions and health-promoting or compromising behaviors. Adjusted for several indices of socioeconomic status, Muslims had more nasal congestion and rhinosinusitis, and consumed more fruit, coffee, and tea. No other differences were found. Muslims and Christians do not differ substantially on a wide variety of health outcomes and behaviors in a Muslim-majority country when equated on socioeconomic status.

The Role of Oxytocin Receptor Activation in the Nucleus Accumbens on Dopamine Release

Patricia Nalan (Psychology)

Using fixed potential amperometry on anesthetized mice, we quantified VTA-stimulation evoked dopamine release both before and after an infusion of oxytocin or PBS (vehicle control) into the NAc in order to determine the effects of oxytocin receptor activation in this region on phasic dopamine functioning. Results are currently trending towards the hypothesis, which states that an infusion of oxytocin into the NAc will decrease phasic dopamine release, increase dopamine autoreceptor (DAR) functioning, and have no effect on dopamine transporter (DAT) functioning. The data is still being analyzed.

Has the Edward Byrne Memorial Federal Grants Program Reduced Drug Overdose Mortality?

Babasoji Oyemakinde (Economics)

The economic and public policy implications of drug misuse and overdose mortalities are well established in clinical and health services research literature. While Cox & Cunningham (2020) studied the effect of Edward Byrne Memorial Grants Program (EBMGP) on drug arrests and crime rates, our current study is unique in its focus on the effects of EBMGP on opioid and drug overdose mortality. In urban counties, we find that Byrne grants are associated with a statistically significant reduction in drug overdose mortality. Surprisingly in rural counties, the grants' effect is associated with a statistically significant rise in drug overdose mortality.

Enhanced Dopamine Autoreceptor Functioning During the Blockade of Dopamine Transporters

Rachel Pace (Psychology)

Dopamine autoreceptors (DARs) and dopamine transporters (DATs) influence dopamine transmission in the brain's mesolimbic pathway. Studies show DARs influence DATs trafficking, but how DATs influence DARs remains unclear. C57BL/6J mice received daily injections of cocaine (DAT blocker) or saline for seven days, then underwent stereotaxic surgery to obtain recordings of DAR-mediated dopamine release both before and during maximal DAT blockade. The current study found that DAR functionality was increased during peak cocaine effects, suggesting DAR work harder to maintain homeostasis. DAT function increased following chronic cocaine exposure, but DAR functioning was unchanged, indicating DAR may be resistant to drug-induced alterations.

Role of Sex in Rate of Infant Vocalization and Canonical Babbling

Janine Peca (Communication Sciences and Disorders)

A female language advantage has been widely reported, although it has not been consistently shown across the literature. Perhaps surprisingly, the possibility of a female language advantage in the first year of life has not been widely studied. In the present study, recordings from 46 infants (28 males, 18 females) over the first 18 months of life were analyzed for volubility and canonical babbling ratio. The findings indicate no clear sex advantage in either canonical babbling or volubility during the first 18 months of life.

Sleep Related Experiences Among Methamphetamine Users: A Qualitative Study

Sanjaya Regmi, Tony Lugemwa (Social and Behavioral Science)

Sleep disturbance is common among people with substance abuse problems. Approximately 65% of methamphetamine users report experiencing insomnia compared to 25% in the general population. This qualitative study explores sleep-related experiences among meth users. Data analysis revealed six themes associated with sleep among the respondents: (1) Started using meth to avoid sleep; (2) Meth users suffer from chronic sleep disorder; (3) Detrimental effects of sleep deprivation; (4) Barriers to getting optimal level of sleep; (5) Sleeplessness interfering with substance use treatment; and (6) Sleeplessness results in quitting meth. This study gives novel insights into effects of meth use on sleep behavior.

Ecological Noise And Its Effect On Speech Perception Performance

Bhanu Shukla (CSD)

The purpose of this study was to develop and validate an ecological noise that can simulate a realistic environment for speech perception testing. First, a unique Ecological Noise (EN) was generated, and then its effect on speech perception was measured and compared with other noises (12-talker babble, 4-talker babble, and SSN) at 0 and +5 dB SNRs. Results showed that speech perception performance was poorer when ecological noise was used compared to all other noises at both the SNRs. These results suggest that Ecological noise presents a more challenging listening situation when compared to multi-talker babble or SSN.

Discretionary Expenditures on Alcohol as a Predictor of Alcohol Use Among Emerging Adults

Austin Varner (Psychology)

Behavioral economics suggests that individuals who overvalue substance-related rewards will experience a higher potential for harmful substance use. Relative discretionary expenditures on alcohol provide an index of alcohol value by calculating the proportion of discretionary money spent on alcohol relative to all discretionary money available. In a sample of emerging adults, (N = 573) relative discretionary expenditures on alcohol were positively correlated with multiple indices of risky drinking. The results suggest relative discretionary expenditures on alcohol may provide a meaningful index of alcohol value and supports behavioral economic emphasis of relative resource allocation demonstrating a component of motivation for drinking.

Effects of Deportation on Children: Immigration & Transgenerational Trauma

Latetrica Wilson (Professional and Liberal Studies)

The purpose of this poster is to describe the mental healthcare needs and management of unaccompanied minors facing immigration proceedings. Over the past few years, there has been a surge of unaccompanied minors who have crossed the border due to increased gang or cartel violence, poverty in their countries, and family reunification. Recent developments in immigration and deportation policy have increased the exposure of these children and adolescents to detention, immigration proceedings and risk of removal. Their history, identified clinical needs and legal situation, can directly affect their current condition, which, in turn may have legal relevance.

Biological Thinking: A Comparison Between Majors and Non-majors Mindsets

Kendra Wright (Biological Science)

In this study, we compared mindsets between novices and emerging experts taking biology courses. We investigated how students' perspectives influenced their continuation in the biology program for majors or increased their interest in learning about biological concepts for non-science majors. Using qualitative analysis of interviews and reflection papers, we found that incoming majors and non-science majors have similar ideas coming into their first biology college course. Within upper division courses, we found that a lot of students' mindsets overtime became fixed due to lack of interest and understanding while preparing for exams.

PRESENTER INDEX