

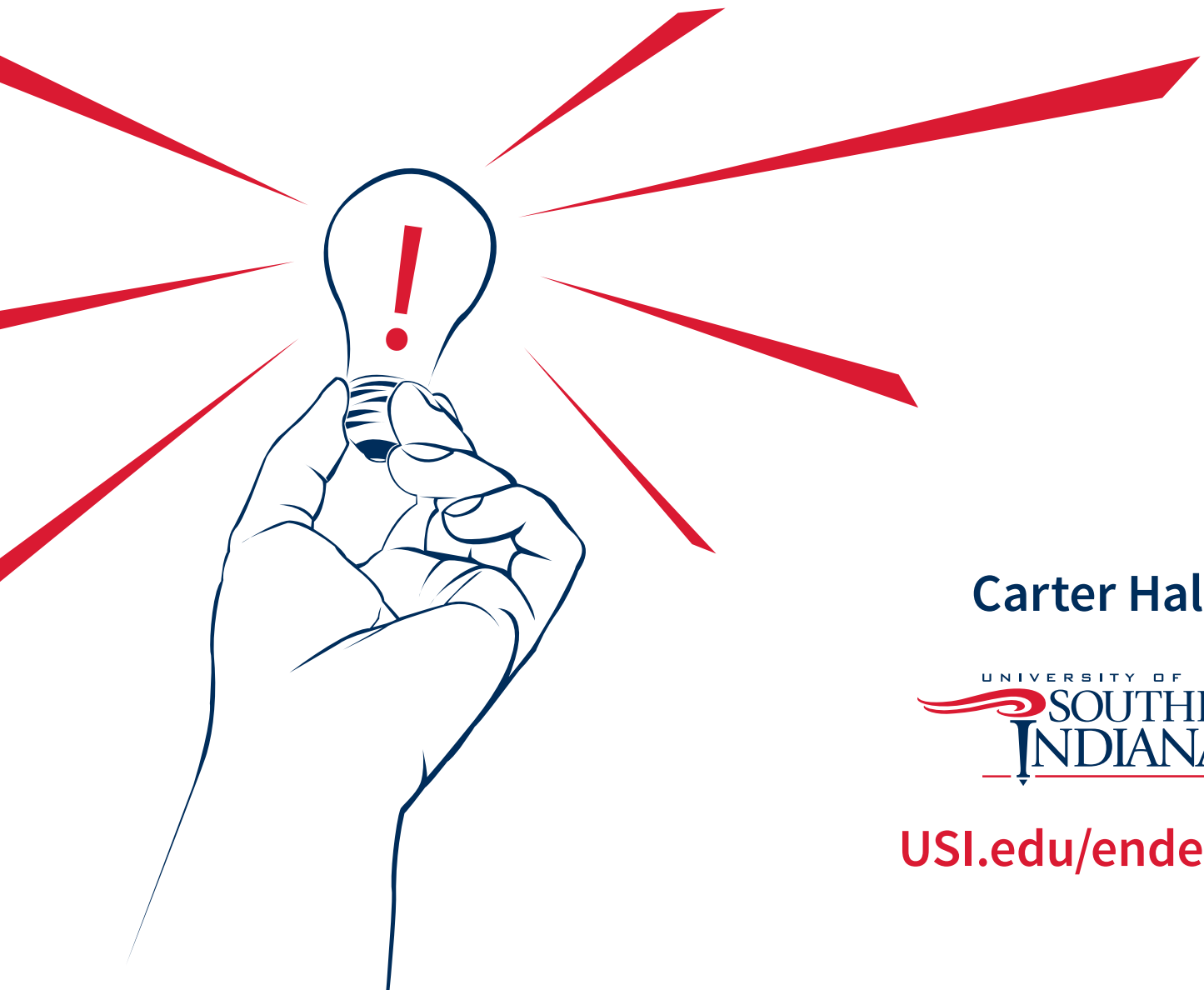
21st Annual Symposium

2023



USI
ENDEAVOR

AWARDS *for*
RESEARCH & CREATIVITY



Carter Hall



USI.edu/endeavor



April 6, 2023

Dear Endeavor Symposium Presenters, Sponsors, and Guests:

Welcome to the 2023 Endeavor Symposium. As I'm sure you've come to appreciate, combining research and learning is one of the best ways to get the most out of your time here at USI, and I hope that the experience has helped to develop strong ties to your education – ties that you will take with you after you leave the university.

You have worked hard on your projects, and we are proud to give you the chance to present the results of your work to the USI community.

Sincerely,

A handwritten signature in black ink, appearing to read "Michael Strezewski". The signature is fluid and cursive, with a large, stylized initial "M" and "S".

Michael Strezewski, Ph.D.
Associate Professor of Anthropology
Director, Endeavor Research and Creativity Awards

Endeavor Symposium Program

Thursday, April 6, 2023

Beginning at 8:45 **Check-in** opens for presenters and sponsors: Pick up your programs and ID badges at registration table (located in the hallway outside Carter Hall).

9 a.m. – Noon **Poster Sessions**, *University Center, Carter Hall D*
(note: all posters must be removed from Carter Hall D by noon).

10 a.m. – Noon **Oral Presentations**, Rooms UC 226 and 227 (next to Carter Hall).

Noon – 1 p.m. **Endeavor Luncheon** for student participants and mentors, *Carter Hall A-C*. Your badge will serve as your lunch ticket.

Endeavor Research and Creativity Awards Committee

Dr. Michael Strezewski Director of Endeavor Awards for Research and Creativity,
Associate Professor of Anthropology, College of Liberal Arts

Dr. Ryan Butler Associate Professor of Nursing, College of Nursing and Health
Professions

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Dr. Jeannie Collins Associate Professor of Chemistry, Pott College of Science,
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Ms. Rebecca Deeg Grant Administrator, Office of Planning, Research, and
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Dr. Ronald Diersing Associate Professor of Engineering, Pott College of Science,
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Mr. Rob Millard-Mendez Professor of Art, College of Liberal Arts

Dr. Erin Reynolds Assistant Professor of Health Services/Administration, College of
Nursing and Health Professions

Mr. Peter Whiting Professor of Library Science, Rice Library

Acknowledgements

The Endeavor Committee thanks the following for their support of the Endeavor Research and Creativity Award Program and Endeavor Symposium:

- Dr. Ronald S. Rochon, President, University of Southern Indiana
- Dr. Mohammed Khayum, Provost
- Dr. Shelly Blunt, Associate Provost for Academic Affairs
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- Dr. Alex Champagne
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- Dr. Henri Maurice
- Mr. Rob Millard-Mendez
- Dr. Elissa Mitchell
- Dr. Taylor Petty
- Dr. Zachary Pilot
- Dr. Jessica Rick
- Dr. Sarah Stevens
- Dr. Michael Strezewski
- Dr. Alyssa Weatherholt

9-10 a.m. POSTER SESSION
Carter Hall D

Lydia Burke, Chloe Carrico, and Leonna Hedrick	The Difference Xylitol Can Make
Yosep Almanza De Leon	Building an Invoicing System for Small Businesses
Charles Davis	Lessons Learned About Orbital Decay from the UNITE CubeSat
Mikaila Ealum	Covid and Mental Health
Emily Green	An Examination of Early Woodland Grave Goods at the Murphy Site
Halle Hehman and Lexi Parisi	The Tie Between Tongues and the Etiology of Sleep Apnea
Jordan Hibbler	The Effectiveness of Plant Extracts on Biofilm Formation of <i>Staphylococcus epidermis</i>
Kelsey Knepp, Lindsay Moody, and Shelly Young	“Pulling” Together for Oral Health
Teddy Lashley	Ascertaining the Significance of the Variability of the Specific Yield Variable during a Flood Event
Alexis Laswell	Exercise After Covid-19
Lucas Sakamaki	Effects of Plant Extracts on <i>Streptococcus mutans</i> Biofilm Formation
Alaina Spahn, Madison Kruer, and Hallie Owen	Comparison of Bruxism in Medicated vs Non-Medicated Anxiety
Sabrina Yamashita	Conflicting Injunctive and Descriptive Norms in the Educational Setting

10-11 a.m. POSTER SESSION
Carter Hall D

Lydia Burke, Chloe Carrico, and Leonna Hedrick	The Difference Xylitol Can Make
Yosep Almanza De Leon	Building an Invoicing System for Small Businesses
Taylor Belcher, Katlyn Louden, and Whitney Robinson	Caries Prevention: In with the New
James Bingaman and William Shehorn	Impacts of Climate Change and Ecosystem Restoration on Precipitation and Groundwater in the Upper Midwestern United States
Jackson Cieslack	Peaking Between the Scales: Lipid Organization in the Stratum Corneum of the American Alligator and Its Resilience to Changing Temperatures
Charles Davis	Lessons Learned About Orbital Decay from the UNITE CubeSat
Varuna Dhanabal and Jessica Nickens	Investigating Synthesis of Polymer Encapsulated BODIPY Nanoparticles for Singlet Oxygen Generation
Libby Dominguez	Using Social Media in a Project-Based Setting: A Student Perspective
Mikaila Ealum	Covid and Mental Health
Alex Antony Edwin	The Impact of Competition on Creativity Across Environmental Conditions
Alexandria Etienne	Do Descriptive Norms Influence Our Willingness to Seek Out Therapy?
Alexandria Etienne and Madison Gerbig	Lipid Profiling on the Molecular Underpinnings of Metabolism and Aging
Madison Gerbig	Atroгене Expression in Gastrocnemius Muscle from Mice Expressing the Alzheimer's Disease-associated Risk-factor R47H TREM2 Variant under Sex Hormones Deficiency

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Jordan Hibbler	The Effectiveness of Plant Extracts on Biofilm Formation of <i>Staphylococcus epidermis</i>
Molly Holsopple and Jessica Nickens	Bacterial Growth and an Investigation into Antibacterial Properties of a BODIPY Derivative
Madeline Houston	American Red Cross Consulting Report
Kelsey Knepp, Lindsay Moody, and Shelly Young	“Pulling” Together for Oral Health
Teddy Lashley	Ascertaining the Significance of the Variability of the Specific Yield Variable during a Flood Event
Alexis Laswell	Exercise After Covid-19
Anna Pittman	The Impact of Victim Age, Prior Arrest, and Victim Blame in Sex Trafficking Decisions
Lucas Sakamaki	Effects of Plant Extracts on <i>Streptococcus mutans</i> Biofilm Formation
Carlos Ivan Solis Rodriguez	High-Temperature Levels Cause Plastic Pipes to Degrade which Leads to Water Contamination
Alaina Spahn, Madison Kruer, and Hallie Owen	Comparison of Bruxism in Medicated vs Non-Medicated Anxiety
Elise Ulrich	Bone Pins of Crib Mound
Audrey Wallace, Alex Edwin, and Sarah Siebers	Examining the Relation Between Dietary Patterns and Positive Psychological Functioning
Sabrina Yamashita	Conflicting Injunctive and Descriptive Norms in the Educational Setting

11 a.m. - noon POSTER SESSION

Carter Hall D

Taylor Belcher, Katlyn Louden, and Whitney Robinson	Caries Prevention: In with the New
James Bingaman and William Shehorn	Impacts of Climate Change and Ecosystem Restoration on Precipitation and Groundwater in the Upper Midwestern United States
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Oral Presentations Session 1, UC 226

10:00 – 10:20	Alayna Daniels – Effects of Popular Media
10:25 – 10:45	Jillian Walker – The Double Empath Problem: Establishing Convergent Validity
10:50 – 11:05	Sophia Evans – Behind the Scenes of Family Fun: An Ethnographic Research Study
11:10 – 11:25	Gabriela Fernandez Gil – The Effects of Music Therapy on the Treatment of Acquired Brain Injuries: A Literature Review
11:30 – 11:45	Olivia Lankford – A Slice of Socialization

Oral Presentations Session 2, UC 227

10:00 – 10:15	Alexis Reed – Construction and Maintenance of a Local Brewery’s Culture, Identity, and Community: An Ethnography
10:20 – 10:35	Vonya Gergis – Supply Chain and Logistical Issues in the Wake of COVID-19: Exploring the Role of Artificial Intelligence in Addressing Key Challenges
10:40 – 10:55	Sarah Siebers – A Systematic and Meta-Analytic Review on Meat Consumption and Disordered Eating
11:00 – 11:15	Candice Beck – We Did This

Oral and Poster Presentation Abstracts

Building an Invoicing System for Small Businesses

Yosep Almanza De Leon

Small businesses often struggle with managing their finances, including creating and sending invoices to customers. Our proposed invoicing system aims to streamline this process and make it more efficient. Invoices provide a clear view of a business's finances and operations. Our system features a user-friendly interface, invoice templates, and security checks. This system will require no setup or installation and will be ready to work out of the box. This invoicing system will be the perfect solution for small businesses looking to streamline their financial management and improve their bottom line. With a user-friendly interface, multiple templates, and a small-business focus, our software will make it easy for small businesses to create and send invoices and stay on top of their finances.

We Did This

Candice Beck

Faculty Mentor: **Mr. Rob Millard-Mendez**

We Did This is an anti-celebration of the fact that guns are the number one killer of children in the United States. Thoughts and prayers pathetically mask the refusal to talk about the destruction shootings cause. I want to smash taboos and not shy away from “getting political” in my work. I created a collection of objects to capture what is lost due to senseless violence. I chose children’s clothing and well used toys to allude to the points in time that are frozen when a child is murdered.

Caries Prevention: In with the New

Taylor Belcher, Katlyn Loudon, and Whitney Robinson

Faculty Mentor: **Mrs. Emily Holt**

Fluoride has been the gold standard for caries prevention. Hydroxyapatite can aid in remineralization of enamel when used in oral care products. Hydroxyapatite is a man-made product that adheres to the tooth structure and creates a stronger surface. In permanent dentition, will hydroxyapatite dentifrice prevent caries more effectively than a fluoride-containing dentifrice? Four studies and two systematic reviews were analyzed to answer the clinical question. Three of the studies concluded that hydroxyapatite equally prevents the formation of caries when compared to fluoride. The fourth study determined that hydroxyapatite was slightly more effective in preventing tooth demineralization than fluoride. A systematic review examining five in-vivo and five in-situ studies concluded that fluoride was able to hinder demineralization while hydroxyapatite could not. The second systematic review examining five studies

concluded that there is good evidence that hydroxyapatite works at least as well as fluoride in preventing caries in the permanent dentition. The research showed that there is no statistically significant difference between the efficacy of hydroxyapatite and fluoride dentifrices. There has yet to be enough in-vivo research to affirm the efficacy of hydroxyapatite dentifrices. Therefore, fluoride dentifrices remain the gold standard and should be recommended to patients until further research is conducted.

Hydroxyapatite-containing dentifrices can be recommended as an alternative to fluoride containing dentifrices when patients decline fluoride. Hydroxyapatite has additional benefits, such as treating dentinal hypersensitivity and being more effective than fluoride for patients with xerostomia because calcium and phosphate ions are not needed for remineralization efficacy. Hydroxyapatite products can be pricey, and most are only available online which limits product accessibility. It would be beneficial for hydroxyapatite-containing dentifrices to be available for in-office distribution to become an accessible alternative for patients.

Impacts of Climate Change and Ecosystem Restoration on Precipitation and Groundwater in the Upper Midwestern United States

James Bingaman and William Shehorn

Faculty Mentor: **Dr. Paul Doss**

The Pines Point Semi-Primitive Area of Manistee National Forest, Michigan lies atop a thick sequence of well-sorted, fine outwash sand which supports a dynamic, linked groundwater-surface water system along the White River. An important aquatic resource, the White River is a designated Michigan State Natural River and candidate Federal Wild and Scenic River. Three drilled monitoring wells (PPW1, PPW2, PPW3) were installed in 2010 and instrumented to record high-resolution groundwater levels shortly after the US Forest service began savanna restoration efforts in Pines Point. Since the mid-1800s, savanna ecosystems have been lost to land use changes throughout the Midwest, including Michigan and Indiana. The Pines Point wells generally record an annual hydrological cycle characterized by a single dominant spring groundwater recharge event. The magnitude, timing, and duration of recharge events vary based upon complex interactions among precipitation, antecedent conditions, and forest management efforts. This investigation seeks to quantify the impact of changes in monthly and annual precipitation and the effects of forest canopy reductions as part of savanna restoration near site on groundwater levels recorded at PPW3.

Over the period of record, total snowfall in the study area has declined greater than 7 cm/year, consistent with anecdotal reports from forest managers. Snowmelt is the dominant source of spring groundwater recharge in this region. Groundwater levels at PPW3, adjacent to a site of forest canopy reduction, show a recharge event in 2021 despite anomalously low annual precipitation and snowfall. We hypothesize the reduced canopy at PPW3 mitigates the influence of reduced precipitation. Moreover, monthly precipitation for the period 2011 – 2022 displays a trend of 0.89cm/year increase in August, and 0.31cm/year increase for October. Increased precipitation in summer and fall is largely consumed by evapotranspiration from vegetation and “refilling” a soil moisture deficit. The increase in precipitation during summer and fall seasons is consistent with larger scale observations of seasonal precipitation trends throughout the Midwest, including Indiana. Correlations among groundwater, precipitation, and forest cover dynamics may permit isolation of distinct hydrologic drivers in this complex and changing groundwater-surface water system.

The Difference Xylitol Can Make

Lydia Burke, Chloe Carrico, and Leonna Hedrick

Faculty Mentor: Mrs. Emily Holt

Dental caries is the most common chronic disease in children. The primary organism resulting in formation of caries is *Streptococcus mutans*. Xylitol is a sugar alcohol containing properties that reduce levels of *Streptococcus mutans* in biofilm and saliva. This literature review examined whether xylitol containing gum would elicit the same results regarding caries prevention than gum containing other sugar substitutes. Six systematic reviews were reviewed to answer the clinical question. Many studies were evaluated in these reviews. There was a wide variation in the structure of the studies and conclusions made. Few studies compared xylitol containing gum to gums with other sugar substitutes. This made formation of a conclusion challenging. Xylitol consumption can provide mild to moderate caries prevention, but this product must be consumed in quantities of 5-10 grams per day to see results. It may be difficult to achieve since it requires exposure to xylitol products multiple times in a day. Compliance may be poor. Dental hygienists should recommend other caries preventative options, such as fluoride, before promoting xylitol products to their patients. If xylitol is promoted, educate the patient about the frequency and total grams needed per day to see results. Over-the-counter xylitol products are affordable and convenient to use. These include products that have xylitol listed as one of the first ingredients, such as gum, hard candy, mints, toothpaste, mouth rinse, moisturizing spray. Xylitol products are an alternative for patients who do not want exposure to fluoride for caries prevention.

Peaking Between the Scales: Lipid Organization in the Stratum Corneum of the American Alligator and Its Resilience to Changing Temperatures

Jackson Cieslack

Faculty Mentor: Dr. Alex Champagne

The stratum corneum (SC), the outermost layer of skin, interacts directly with the environment making it an important factor in regulating cutaneous water loss. The SC is composed of flat, dead cells embedded within lipid layers, and the properties of an animal's SC and attendant lipids are representative of their environmental niche and evolutionary history. The American Alligator (*Alligator mississippiensis*) is a semiaquatic reptile classified as an Archosaur, a clade that includes crocodilians, dinosaurs, and birds. Thus, learning about the properties of alligator SC and comparing these properties to those of birds may lend insight to the physiology of extinct Archosaurs such as dinosaurs. In this study, we used infrared spectroscopy to measure temperature dependent changes in lipid chain disorder in American Alligator SC. We isolated SC from the interscale region of the arm in 10 alligators and collected absorbance spectra for each sample between 25 and 50°C. We analyzed the change in position of the CH₂ scissoring region (1500-1420 cm⁻¹) and the CH₂ symmetric stretching peak (~2850 cm⁻¹), which provide information on the phase state and relative disordering of lipids, respectively. The CH₂ scissoring region did not change as a function of temperature and the shape of the peak suggests that lipids were predominantly in the hexagonal phase. The CH₂ symmetric stretching peak shifted to a higher frequency as SC temperature increased, with a

marked increase at 40°C. This pattern suggests a shift to a more disordered lipid phase brought about by an increase in temperature. Taken together, these results suggest that lipids in the SC of American Alligators are more disordered and less resilient to changes in temperature compared with lipids in the SC of birds. This further suggests that despite some similarities in SC lipid composition between birds and alligators, they ultimately have different properties of lipid organization. These differences may reflect differences in environment and lifestyle.

Effects of Popular Media

Alayna Daniels

Faculty Mentor: **Dr. Elissa Mitchell**

I will be writing a literature review on the topics of how popular media affects its users and specifically the topics of mental health, substance abuse, and child maltreatment, which are the areas of my social work major in which I wish to specialize in during my career. I will be using examples of these media portrayals if these topics through a powerpoint presentation which will be an open discussion with comments and questions available to the audience.

Lessons Learned About Orbital Decay from the UNITE CubeSat

Charles Davis

Faculty Mentor: **Dr. Glen Kissel**

The University of Southern Indiana (USI) Undergraduate Nano Ionospheric Temperature Explorer (UNITE) CubeSat, funded by NASA's Undergraduate Student Instrument Project – 2 (USIP-2), was deployed from the International Space Station on January 31, 2019. UNITE was a 3U CubeSat without deployables that was passively stabilized magnetically and aerodynamically. The UNITE CubeSat reentered the atmosphere on October 21, 2021, its 995th day in orbit. One of the mission objectives of UNITE was to track its orbital decay with the intent of updating CubeSat drag models. The original predicted mission lifetime of 428 days was based on results from a spreadsheet available with Space Mission Engineering: The New SMAD, using standard CubeSat parameters and simply assuming “solar mean” for the solar cycle. To more accurately understand the actual orbital behavior known from the TLEs (two-line elements), a completely new algorithm was coded for orbital drag, but taking into account varying atmospheric densities consistent with the variability of the actual solar cycle experienced between January 2019 and October 2021. Using the algorithm and the updated atmospheric density model, the mission time was computed to be 976 days, only 19 days short of the actual mission time. Next, the drag coefficient was adjusted from 2.2 to 2.08, and with that change the algorithm correctly calculated the 995 days in orbit. Also of note, in the process of the development of the algorithm, a slight error was discovered in the Bessel function table available through The New SMAD, and that was corrected, as well. The new algorithm, developed by the undergraduate student, was implemented in an Excel program and is readily available for use by other teams. With the implementation of a new algorithm that accounts for solar cycle activity and allows for

drag coefficient adjustment, it is hoped that future CubeSat teams will be able to predict mission life and the orbital decay more accurately.

Investigating Synthesis of Polymer Encapsulated BODIPY Nanoparticles for Singlet Oxygen Generation

Varuna Dhanabal and Jessica Nickens

Faculty Mentor: **Dr. Priya Hewavitharanage**

Photodynamic therapy (PDT), an alternative cancer treatment, uses light to activate light-sensitive drug molecules or photosensitizers. Once excited by light, photosensitizers generate a toxic substance to kill cancer cells. The 4,4-difluoro-4-bora-3a,4a-diaza-s-indacene (BODIPY) derivatives are promising candidates for various biomedical applications including PDT. Some derivatives of BODIPY, when irradiated with an appropriate wavelength of light, can transfer their energy to atmospheric oxygen to produce singlet oxygen which kills nearby cancer cells. One major challenge of the BODIPY molecule is its hydrophobic (“water-fearing”) nature, requiring slightly toxic solvents such as dimethyl-sulfoxide (DMSO) to remain in solution. To circumvent this challenge, the use of an amphiphilic polymer to synthesize a polymer-encapsulated BODIPY nanoparticle was investigated. Amphiphilic polymers contain both hydrophilic (“water-loving”) and hydrophobic regions, in which the external hydrophilic regions will favorably interact with aqueous solutions. Simultaneously, the internal hydrophobic regions interact with the BODIPY derivative to form a water-soluble cage-like structure. An iodine-containing BODIPY derivative was synthesized and water-soluble nanoparticles synthesis of this derivative was investigated.

Using Social Media in a Project-Based Setting: A Student Perspective

Libby Dominguez

Faculty Mentor: **Dr. Jessica Rick**

A strategy for using social media greatly improves an organization or business. Simply applying personal knowledge of social media to a professional account is rarely beneficial. In the Spring of 2022, I took a course where I learned how to professionally run social media platforms. For a class project this knowledge was applied to the University of Southern Indiana’s Communications Department’s social media pages, specifically Instagram and Facebook. Tools such as smart goals, content calendars and style guides were used to plan out specific content that would be released on the account’s feed. Most of the information that was gathered was quantitative. Results that were measured from this project were how many followers were gained, how many interactions were received, what types of interactions were there, who reacted to posts, and what type of content was most successful. This projected resulted in roughly 100 new followers on Instagram, an increase in like and shares on posts, more comments on each post from followers, engagement from not only students and faculty but also parents and alumni, and the ability to see that the audience preferred content with faces rather than just graphics. Stepping out of the way that social media is used for personal reasons and learning to apply professionalism and tactics will greatly advance an organization or business of any sort. With creativity and further knowledge on social

media, the Communications Department's platform targeted a wide range of audiences as well as developed a consistent brand-voice and content.

Covid and Mental Health

Mikaila Ealum

Faculty Mentor: **Dr. Zachary Pilot**

The current study examined the trends in depression and emotion regulation for students (n = 899) at one university in the Midwest United States from prior to the COVID-19 pandemic (Fall 2019) through the Spring 2022 semester. An analysis of covariance (ANCOVA) was conducted, controlling for difficulties in emotion regulation and gender identity. The ANCOVA indicated that depression was significantly lower in Fall 2019 than in the remaining five semesters under investigation. Results of these analyses appear to indicate that depression rose significantly in students at MU after the onset of the pandemic and implementation of social restrictions. This negative effect appears to have had a lasting impact and the pandemic appears to have had deleterious effects on mental health regardless of emotion regulation abilities and/or gender identity. Limitations and implications for researchers, clinicians, and professionals in higher education will be discussed.

The Impact of Competition on Creativity Across Environmental Conditions

Alex Antony Edwin

Faculty Mentor: **Dr. Srikanth Dandotkar**

Creativity is a vital force in entrepreneurship and most other real-life processes. Consequently, it would be a boon to society to find the optimal conditions to facilitate creativity. This study examined the effect of 2 variables, environment (test and game-like environments), and motivation (extrinsic and intrinsic) within the context of competition on creativity. Data was collected from students from the University of Southern Indiana where participants were manipulated via the instructions specific to the group that they were randomly assigned to and creativity was assessed via the Divergent Association Task (DAT) test. The participants also took an Intrinsic Motivation Inventory (IMI) after completing the DAT test. We ran a 2 X 2 BS Factorial ANOVA on the DAT scores, and the results demonstrated no significant main effects or interactions. However, it is important to note that there was a marginally significant main effect of motivation (P= 0.09). This indicates that motivation might possibly have a significant effect on creativity as measured by the DAT test.

Do Descriptive Norms Influence Our Willingness to Seek Out Therapy?

Alexandria Etienne

Faculty Mentor: **Dr. Julie Eyink**

Despite needing therapy, or mental health services, many people still fail to seek out treatment. To investigate these behaviors, this study plans to look into how social norms, or shared standards of acceptable behavior affect treatment seeking. Specifically, descriptive social norms will be investigated. Descriptive norms delineate an individual's perceptions about the prevalence of a behavior. As such, descriptive norms influence one's behavior, as descriptive norms refer to the beliefs one has about the most common actions of their social group. This offers the theory that descriptive norms lead to a decreased willingness to seek out therapy, as therapy has not always been socially acceptable, and therefore not common within an individual's social group. This study aims to investigate if we can use descriptive norms as an intervention to increase therapy willingness. Participants may be exposed to one of three conditions: reading a high descriptive norm statement about therapy (e.g., most people go to therapy), reading a low descriptive norm statement about therapy (e.g., most people do not go to therapy), or neither (receiving no article), serving as the control. After, participants will fill out a survey where they express their attitudes toward seeking therapy (Attitudes Toward Seeking Professional Psychological Help), another about their own stigmas towards therapy (Self-Stigma of Seeking Psychological Help), their willingness to go to therapy (Therapy Willingness), and one where they give demographic information.

Lipid Profiling on the Molecular Underpinnings of Metabolism and Aging

Alexandria Etienne and Madison Gerbig

Faculty Mentor: **Dr. Alex Champagne**

The membrane pacemaker hypotheses of aging and metabolism suggest that lipids in an organism's cell membrane have an important role in organism longevity and metabolic rate, respectively. Previous studies have attempted to link cell membrane phospholipid properties to differences in metabolic rate and longevity but have yielded conflicting results. These discrepancies may arise because these studies often examined phospholipid head groups or the properties of the lipids' fatty acid tails, but rarely both. To fill this gap, we plan to first validate a method to separate and quantify lipids by their phospholipid head group before separating them from their fatty acid tails. We will first load and develop fatty acid standards on preparative thin layer chromatography (TLC) plates, followed by visualization of the free fatty acids with 6G Rhodamine solution under UV light. The visualized lipid bands will then be scraped off the plate and redissolved. Subsequently, these lipids will be loaded and developed on an analytical TLC plate and visualized with cupric acetate spray followed by charring. We will then use photodensitometry to quantify the lipids and compare with the initial amount loaded onto the preparative TLC plate. This will allow us to analyze the percentage of lipids retained throughout the process and assess the efficacy of preparative thin layer chromatography for complete fatty acid analysis. Upon validating this method, we hope to use preparative and analytical thin layer chromatography to quantify phospholipid classes and

their fatty acid tails from the muscle tissue of birds with different metabolic rates and lifespans, thus providing a holistic correlation of membrane lipid properties with longevity and aging.

Behind the Scenes of Family Fun: An Ethnographic Research Study

Sophia Evans

Faculty Mentor: **Dr. Jessica Rick**

As a team member of a mid-western family-owned theme park, I gained first-hand experience behind the scenes of family fun. The purpose of this ethnography was to understand how the transfer of power affects the work culture behind family fun. To uncover the impacts of power transfer and its influence on work culture, I first provided a review of relevant literature, described the methods utilized during the research process and analyzed the ethnographic findings. Additionally, I wanted to understand the employee dynamics involved in the work culture of this mid-western family-owned theme park from a communicative perspective. Finally, this ethnographic research will extend scholarly work on workplace culture within the attraction industry.

The Effects of Music Therapy on the Treatment of Acquired Brain Injuries: A Literature Review

Gabriela Fernandez Gil

Given the increased prevalence of brain injuries worldwide, it is imperative to understand the mechanisms that allow the brain to heal. While numerous treatments are used to treat acquired brain injuries, music therapy was shown to be the most effective in accelerating neuroplasticity and treating traumatic and non-traumatic brain injuries. Therefore, to examine the effectiveness of this treatment, the purpose of this study was to review the existing literature on the effects of music therapy in patients with brain injuries and qualitatively determine its effectiveness. A search of databases (PubMed, PsycINFO, PsycARTICLES) was conducted for research examining the effects of music therapy in patients with brain injuries. Over 20 studies were found and 9 of them were included. They examined the effects of music therapy on traumatic brain injuries (4 studies), non-traumatic brain injuries (2 studies), and both types of acquired brain injuries (1 study). Additionally, I found two systematic reviews and meta-analyses. Four studies demonstrated that music therapy improves patients' expressive language, verbal memory, attention, social interaction, mood, and motivation; in two studies, patients improved their stride length, motor coordination, and cadence; in one study, patients increased their gray matter; and in two studies, patients' depression levels improved. Current literature suggests that music therapy is effective in treating acquired brain injuries when preferred music is used. Given its effectiveness, music therapy should be used in patients early to decrease the worsening of their symptoms and improve their recovery. However, the generalizability of the current findings is limited. To improve future studies, researchers should implement non-biased recruitment strategies, probability sampling, and large sample sizes. Finally, experimental, quasi-experimental, and longitudinal study designs would help to determine the causal and temporal effectiveness of music therapy.

Atrogene Expression in Gastrocnemius Muscle from Mice Expressing the Alzheimer's Disease-associated Risk-factor R47H TREM2 Variant under Sex Hormones Deficiency

Madison Gerbig

Faculty Mentor: **Dr. Alex Champagne**

Patients with Alzheimer's often exhibit musculoskeletal complications such as osteoporosis and associated muscle atrophy, but a mechanism connecting the two diseases has yet to be established. A variant of the TREM2 signaling factor known TREM2 R47H/+ has been linked to neuroinflammation in Alzheimer's patients and is found in both brain and bone tissue, suggesting a possible link between the two diseases. Unexpectedly, TREM2 R47H/+ mice show sex discrepancies, where female mice show increased hindlimb muscle function, and the males exhibit no change. These data suggest that female sex hormones may have protective effects against the TREM2 variant. To further explore the role of sex hormones in this system, we suppressed sex hormones in 4-month-old male and female wild type and TREM2 R47H/+ mice via gonad removal surgery (gonadectomy), while subjecting others to control surgery. Six weeks after surgery, we euthanized all individuals and isolated the gastrocnemius muscle in the legs. We then compared the expression of 5 muscle atrophy genes by isolating RNA from the gastrocnemius, followed by cDNA preparation and qPCR analysis. Relative expression for all genes was examined using the $\Delta\Delta C_t$ method and statistically analyzed with a 2-Way ANOVA. No significant differences in gene expression were found for either sex, genotype, or surgical treatment. Taken together, our results suggest that changes in muscle atrophy gene expression may occur before 6-weeks post-surgery in mice carrying the TREM2 R47H/+ variant. Future studies may clarify the time at which gene expression is altered by examining multiple time points post-surgery.

Supply Chain and Logistical Issues in the Wake of COVID-19: Exploring the Role of Artificial Intelligence in Addressing Key Challenges

Vonya Gergis

Faculty Mentor: **Dr. Susan Ely**

The onset of the COVID-19 pandemic has brought significant challenges to supply chain and logistics practices. Three years later, weaknesses in the supply chain are still evident due to the unprecedented circumstances the COVID-19 pandemic brought. Simultaneously, artificial intelligence (AI) has been a large topic of discussion in how it will affect our world. This presentation provides an overview of the impact of the COVID-19 pandemic on supply chains based on a review of relevant literature and identifies the key issues that have arisen in supply chains due to the pandemic. Then, it examines potential solutions that utilize artificial intelligence to address these key issues and improve supply chain resilience.

An Examination of Early Woodland Grave Goods at the Murphy Site

Emily Green

Faculty Mentor: **Dr. Michael Strezewski**

Over the past two semesters, I have been cataloging and organizing materials from the Charles Lacer collection. Lacer was a local amateur archaeologist who conducted his own excavations during the early 1960s. Much of his extensive collection is housed in the archaeology lab at USI, and Dr. Strezewski is in the process of sorting and cataloging the thousands of artifacts in order to develop an inventory of the collection's contents. To help with this undertaking, I have been studying artifacts from the Murphy Site, located at the confluence of the Wabash and Ohio Rivers, in Posey County. Past research on this site has been mostly limited to the Caborn-Welborn occupations, which took place during the fifteenth and early sixteenth centuries. My research focused on an earlier occupation possibly dating back to the late Early Woodland and early Middle Woodland periods, circa 200 B.C. After cataloging the artifacts, I studied the skeletal remains in an effort to determine the age and sex of the individuals. My goal was to piece together which grave goods were buried with which individuals. Another goal was to ascertain when these early occupations took place. In order to determine the age of this earlier occupation, five carbon dates were submitted. Two of the dates indicated an Early Woodland occupation around 400 B.C. (late Early Woodland). These dates were run on the remains of burned food found inside two potsherds. Two others, run on an animal canine tooth and a drilled piece of antler, showed a second occupation around 200 B.C. (also Late Early Woodland). We believe that the burials likely date to this second occupation. The fifth date, run on an antler tool, indicated a date of circa A.D. 1550 and is therefore part of the Caborn-Welborn occupation of the site.

The Tie Between Tongues and the Etiology of Sleep Apnea

Halle Hehman and Lexi Parisi

Faculty Mentor: **Mrs. Emily Holt**

Obstructive sleep apnea (OSA) is a condition that is induced by the collapse of the airway. The airway is kept open through negative pressure from the tongue on the palate and keeping the mouth sealed. When the mouth is opened during sleep, the pressure is lost, and the airway becomes obstructed. One reason for the loss of suction of the tongue on the palate is the presence of a short lingual frenum, or ankyloglossia. A frenectomy can release the tongue from the lingual frenum.

Do individuals who have untreated ankyloglossia have a greater chance of developing OSA than those who received treatment with a frenectomy? Two studies and a literature review were evaluated to determine the impact of receiving a frenectomy related to OSA outcomes. The first study concluded that children with an untreated short lingual frenum displayed abnormal tongue function linked to sleep disordered breathing. Frenectomy aids the correction of OSA, but it is insufficient for resolving all abnormal sleep patterns. The second study determined that sleep improved in 83% of those who had frenectomies. The literature review included four studies. Two of the studies concluded that untreated ankyloglossia is associated with OSA. A third study in the literature review concluded that sleep improved

after receiving a frenectomy. A fourth study concluded that frenectomy combined with myofunctional therapy is effective in the treatment of snoring and mouth breathing.

Individuals who experience ankyloglossia have a greater chance of developing OSA than those who received a frenectomy. It is important that dental professionals know other treatments related to OSA. A natural way to open the airway is called myofunctional therapy. This technique trains the muscles of the tongue, throat, and face. Other treatments include sleep devices such as continue positive air pressure (CPAP), oral appliances, or surgery. It is recommended that individuals with OSA sleep on their side. Dental professionals can offer OSA screenings to all patients and refer them to their physicians if it is suspected.

The Effectiveness of Plant Extracts on Biofilm Formation of *Staphylococcus epidermis*

Jordan Hibbler

Faculty Mentor: **Dr. Henri Maurice**

Biofilms are an important part of bacterial growth in their ability to resist antibiotics once they have formed. Their ability to recruit more bacteria into their structure, thereby prolong infection, is not to be overlooked. Therefore, finding ways to combat biofilm formation is a pressing matter in relation to the medical field. The results from this experiment have shown extracts from the plant *Solanum interfolium* and *Mirabilis longiflora* show promise in their ability to inhibit biofilm growth, compared to controls.

Bacterial Growth and an Investigation into Antibacterial Properties of a BODIPY Derivative

Molly Holsopple and Jessica Nickens

Faculty Mentor: **Dr. Jeannie Collins**

Escherichia coli is a common gram-negative bacterium found in the environment and guts of animals, including people. Some strains of *E. coli* are harmless, but others can make one ill. A BODIPY derivative with two iodine atoms attached to the molecule was synthesized and isolated. A laboratory strain of *E. coli* was utilized to investigate the antimicrobial properties of the BODIPY derivative by introducing it into a bacterial liquid culture and irradiated with white light. BODIPY can form singlet oxygen when irradiated which may contribute to its antimicrobial properties. The liquid cultures were plated on LB agar to compare colony forming units of all trials and the optical density of the liquid cultures were compared using UV-Vis spectrophotometry. Results of the treatment will be presented.

American Red Cross Consulting Report

Madeline Houston

This is a consulting report over the American Red Cross including an evaluation of the company and recommendations for improvement. The evaluation section will include a company overview, performance assessments, external analysis, internal analysis, evaluation of the business level strategy, and SWOT analysis.

“Pulling” Together for Oral Health

Kelsey Knepp, Lindsay Moody, and Shelly Young

Faculty Mentor: **Mrs. Emily Holt**

Caries, which is caused by the bacteria *Streptococcus mutans*, is the most common chronic disease in children and there are many adults who struggle with caries also. Mouth rinses are the safest and most effective method used to reduce the presence of *Streptococcus mutans*. Two rinse options include chlorohexidine gluconate (CHX) and use of oil pulling. CHX is a prescribed antibacterial mouth rinse and oil pulling uses sesame, olive, coconut, or sunflower oil.

In patients with a high caries risk, will daily oil pulling result in more reduction of *Streptococcus mutans* than twice daily use of chlorohexidine gluconate rinse? Four systematic reviews and one randomized study were evaluated to answer the clinical question. Both CHX and oil pulling provide a reduction in the count of *Streptococcus mutans*. CHX has many adverse side effects with long term use. Oil pulling did not create adverse side effects. Oil pulling appears to be the best option since it does not create adverse side effects and also provides additional benefits.

Oil pulling is affordable, accessible, and sustainable to reduce bacteria in the mouth for every patient. Its long-term use is not contraindicated. CHX is contraindicated for long-term use due to adverse side effects.

A Slice of Socialization

Olivia Lankford

Faculty Mentor: **Dr. Jessica Rick**

Starting a new job can be scary for anyone, but starting a job at a business where everyone already knows each other is even worse. The restaurant industry is a fast-paced environment where many employees work together frequently and in close quarters. Since employees have already adjusted to the business and formed their relationships, new hires could find this intimidating. There is one thing that every employee must experience: socialization. Some businesses and people are better at this exemplifying this skill than others. This analysis draws on 3 months of participant observation in the restaurant, detailed

field notes, informal interactions and conversations, and one formal interview with my manager. Furthermore, I considered the data through the lens of my own 2 years of experience in the restaurant industry and 5 years in customer service. In this research, I explored reasons that people enter restaurant work for the first time, reasons to stay, and how the experience of socialization influences their identities, life choices, goals, feelings, decisions, and behaviors. I examine how and why the organizational, structural, and interpersonal features of restaurant work shape the lives of the employees. This ethnography is about the restaurant culture and how the restaurant setting influences employees' identities and behaviors. The purpose of this research is to advance the understanding, view, and conceptualization of restaurant work and its employees. In this paper, I will provide a review of the literature, describe methods used in this data collection process, and analyze my findings. I will also provide a textual analysis of the physical space of the restaurant and explain how it is important in the overall culture and research.

Ascertaining the Significance of the Variability of the Specific Yield Variable during a Flood Event

Teddy Lashley

Faculty Mentor: **Dr. Andrew Hill**

The variable of specific yield determines how much water in a given volume will yield when drained by gravity. While this variable is considered to be a constant of one for most applications, this can give rise to significant error when considering a flood event over a short period of time. Utilizing the fourth-order Runge-Kutta method of flood routing as a novel approach to prove specific yield does not always equal one, the results have been shown that it is not exactly equal to one and changes with the depth of water during the flood event. More complex methods are being utilized right now, so more accurate results cannot be expressed at this time.

Exercise After Covid-19

Alexis Laswell

Faculty Mentor: **Dr. Alyssa Weatherholt**

“Long covid” is a term coined while referring to those who continually experience related symptoms for a more extended period of time than what is considered normal. A study that included 200 participants has concluded the ways that post covid-19 syndrome changes a body’s ability to engage in exercise testing, specifically cardiopulmonary. Their peak VO₂ was reported consistently lower than the control group that did not suffer from the aftereffects of covid, by a noticeable margin. The test group also displayed negative symptoms much more commonly while engaging in testing. Both of these factors contribute to the final result that the chance of the subjects actually achieving their target threshold was significantly lowered.

It can be widely agreed upon that pace of re-entry into exercise after a bout of covid should be gradual. Failing to do this could result in further injury or setbacks. Variations of any common exercise should be heavily utilized for easier transition. The United Kingdom National Institute for Health Research

suggests using a “symptom-led approach” when making progressions, while remembering to rest appropriately. Some may consider strength and resistance training to be of more importance for post-covid individuals, especially if they needed a hospital or ICU stay, because of the muscle loss suffered due to immobility. Appropriate intensity levels should be set closer to moderate ranges than higher extremes to avoid unnecessary inflammation. After Covid In patients who stayed in an ICU due to their covid diagnosis, professionals were able to distinguish key body changes. Overall functioning of the heart, lungs, and peripheral muscles was most widely noted as well as the nervous, immune, and excretory systems exhibiting changes. Of course, exercise ability was the most common deficiency.

The Impact of Victim Age, Prior Arrest, and Victim Blame in Sex Trafficking Decisions

Anna Pittman

Faculty Mentor: **Dr. Taylor Petty**

To combat sex trafficking, a victim centered approach, compared to current law enforcement strategies, can result in the prosecution of traffickers, and offer needed services to survivors. This experimental study examined whether a female’s age, prior arrest history, and vulnerability impact whether officers view her as a victim or an offender. Results demonstrated participants differed in their treatment of the victim depending on her prior arrest history, not her age. Participants reported lower perceptions of victim blame toward a vulnerable female with no prior arrest, which predicted more certainty she should receive social services over legal consequences.

Construction and Maintenance of a Local Brewery’s Culture, Identity, and Community: An Ethnography

Alexis Reed

Faculty Mentor: **Dr. Jessica Rick**

Inner city, locally owned bars are integral parts of communities utilized to create third spaces. Third spaces offer individuals a place to decompress, build relationships, and find comfort in a neutral zone where social interaction may occur away from the stresses of home and work. In this ethnography, I explore the culture of a local bar in a midwestern, midsized city. The values, beliefs, and morals uncovered focused strongly on community, family, trust, and loyalty. This ethnography aims to inspire unique conversations surrounding the ways in which culture and community are constructed and maintained for a specific group of individuals subscribing to the membership of a small, local bar and the impacts of spatial structure on themes such as those previously listed.

Effects of Plant Extracts on *Streptococcus mutans* Biofilm Formation

Lucas Sakamaki

Faculty Mentor: **Dr. Henri Maurice**

In my Professor guided independent research, I observed the effects of various plant extracts, such as *M. jalapa*, *E. oxypetalum*, *S. integrifolium*, *M. nyctaginia*, and *M. longiflora*, on the formation of *Streptococcus mutans* biofilm formation using a 96-well assay.

A Systematic and Meta-Analytic Review on Meat Consumption and Disordered Eating

Sarah Siebers

Faculty Mentor: **Dr. Urska Dobersek**

The relation between eating pathologies and meat abstention (vegetarianism, veganism) is well established. However, to date, no reviews examined the relation between eating disorders and dietary patterns as a categorical variable. Therefore, the purpose of this systematic review and meta-analysis was to examine the quantitative and qualitative relations between meat consumption or avoidance and eating pathologies. In October 2022, we searched six online databases (PubMed, Web of Science, PsycINFO, CINAHL, PsycARTICLES, Cochrane Library) for primary studies examining differences in disordered eating between meat abstainers and meat consumers that offered a clear distinction between these groups. The initial search resulted in 10,213 primary studies. We anticipate that between 20 and 25 studies will meet our inclusion/exclusion criteria. Afterwards, we will extract the relevant information (e.g., author, participants, etc.) and perform methodological rigor analysis. Additionally, we will present qualitative findings and calculate the magnitude of the effect between meat consumers and meat abstainers with bias correction (Hedges's *g* effect size) where higher and positive scores will reflect better outcomes (fewer eating pathologies) for meat consumers. We anticipate that meat consumption would be associated with lower eating pathologies compared to meat abstention. With respect to clinical practice, the avoidance of meat may be a behavioral marker that signifies poorer eating pathologies.

High-Temperature Levels Cause Plastic Pipes to Degrade which Leads to Water Contamination

Carlos Ivan Solis Rodriguez

Faculty Mentor: **Dr. Marco Lara Gracia**

Nowadays, the best option to build a tubs system is plastic pipes, such as high-density polyethylene (HDPE), cross-linked polyethylene (PEX), polyvinyl chloride (PVC), and chlorinated polyvinylchloride

(CPVC). This variety of plastic pipes degrades when they are exposed to shortwave ultraviolet radiation. When this occurs, some of the chemical components that leach into the water supply can negatively impact living cells with elevated concentrations of one part per trillion of harmful chemicals. This project focuses on finding possible and sustainable solutions to solve this problem by using biomimicry, which is the emulation of the models, systems, and elements of nature for the purpose of solving complex human problems. The target was to find a viable way to reduce the high-temperature levels on plastic pipes. Results indicate that using a prismatic layer of rock wool with a design of the shape of the striped bass' scales, it is possible to lower the temperature of the PVC pipes and consequently reduce the contamination of water.

Comparison of Bruxism in Medicated vs Non-Medicated Anxiety

Alaina Spahn, Madison Kruer, and Hallie Owen

Faculty Mentor: **Mrs. Emily Holt**

Bruxism may be present in people with untreated anxiety. Bruxism is the repetition of clenching and grinding one's teeth causing damage to the hard tissues of the mouth. This can lead to problems such as temporomandibular joint disorder, headaches, attrition, broken teeth, and even pain in the neck or face. Some treatment options for anxiety include medication, relaxation techniques, and therapy. Medications that treat anxiety include Selective Serotonin Reuptake Inhibitors (SSRIs), Selective Norepinephrine Reuptake Inhibitors (SNRIs), anxiolytics (benzodiazepines, buspirone), and beta-blockers (propranolol).

In individuals with anxiety, is bruxism more prevalent if anxiety is not treated with medication compared to individuals who take an anti-depressant medication? One literature review, study, and systematic review were reviewed to determine a conclusion. The literature appraisal determined that SSRIs induce bruxism and was inconclusive of which antidepressants do not cause bruxism. The study looked at different SSRI medications and the incidence of bruxism. Individuals prescribed citalopram, sertraline, and escitalopram were more likely to report temporomandibular joint discomfort than those who took other SSRIs. The systematic review determined that the prevalence of bruxism is higher in those who are taking antidepressants such as paroxetine, venlafaxine, and duloxetine.

The research showed that SSRI and SNRI medications used to treat anxiety can cause more bruxism and are often a side effect of the medications. With this being the case, it shows that medications are not always beneficial in this aspect of preventing bruxism. People often think that since the medication reduces one's anxiety, then they won't clench or grind as much. In reality, medication can worsen the issue. If patients are looking for alternative treatment options for their anxiety, they could try anxiolytics instead of antidepressants. It is difficult to validate if this will work. It appears that more evidence is needed to be certain of this connection. Dental professionals should pay close attention to the type of medications their patients are taking, as this can have a direct correlation to the increased prevalence of bruxism.

Bone Pins of Crib Mound

Elise Ulrich

Faculty Mentor: **Dr. Michael Strezewski**

Crib Mound is a shell mound in Spencer County, Indiana that was occupied over many thousands of years and has yielded a wealth of artifacts. Over the many decades the site suffered from erosion by the adjacent Ohio River which has caused a lot of destruction to the site. The Crib Mound site has also been heavily looted by collectors, so most artifacts recovered from the site do not have any context.

For this project I looked at bone pins from the Crib Mound site. The pins are from the Charlie Lacer and Art Gerber collections which are housed in the USI archaeology lab. Both men were artifact collectors. Bone pins are either hairpins or clothing items that are made from carved animal bones. They are thought to date to the late Middle Archaic period, circa 4000 B.C. Some are decorated with a variety of carved designs. There are also a variety of head shapes on these pins, which have been given various names such as “T-top,” “Crutch top,” by archaeologists. This project is an extension of previous work done by Andrew White and Richard Jefferies. White’s belief was that square-top and fishtail types were earlier in time, while the T-top and crutch-top were later types. My work was to test if White’s hypothesis was correct and to also see if there was any overlap with decorations and head types on the bone pins. In my study there were 159 head sections, 33 mid-sections, 156 tips, 4 nearly whole pins, 39 whole pins, and 1 unidentifiable portion. Decorative motifs identified included 7 straight line with dots, 1 zoned zig-zag, 3 cross hatch, 11 straight line, 6 concentric zig-zag, 8 concentric step, 8 concentric box, 2 unidentified, and 139 bone pins with no decoration at all. Five bone pin samples were sent to be carbon dated at the University of Georgia. The dates returned ranged from about 3700 to 4200 B.C. Compared to White’s suggested chronology, my bone pins were older than he suggested. The dates obtained suggest that White’s chronology may need to be updated.

The Double Empath Problem: Establishing Convergent Validity

Jillian Walker

Faculty Mentor: **Dr. Zachary Pilot**

The current Theory of Mind (ToM) paradigm describes individuals with Autism Spectrum Disorder (ASD) as possessing a deficit or entirely lacking the capabilities to understand and predict the mental states of others. The Double Empathy Problem states that while autistic individuals may not accurately predict the mental states, beliefs, and intentions of a non-autistic, or allistic, individual, the reverse may be true as well. Previous studies have tested the differences in ToM capabilities between autistic and allistic individuals using popular measures like the Reading of the Mind in the Eyes (RME) task, but a major limitation of ToM research is the lack of autistic targets featured in stimuli. Mitchell, Sheppard, and Cassidy (2021) found that there are many detrimental effects of the Double Empathy Problem, but there has not been an empirical test of its claims. In the current study, autistic and allistic participants were asked to read a series of vignettes involving scenarios encountered by individuals on the autism spectrum written without the use of mental state terms or explicit ages. Participants were asked multiple questions

about the vignettes, including why the target acted as they did, the relatability of the target, and the age of the target. We will compare scores on the RME task between allistic and autistic groups, then we will conduct a correlation between the DV's. We expect a significant difference between the autistic and allistic groups on the RME task and measures of relatedness and a negative correlation between those same measures. Currently, there is a lack of empirical evidence examining the Double Empathy problem, the implications of which have the potential to change the way ToM research is conducted by featuring more autistic targets in experimental research. If evidence is found for the Double Empathy Problem, it could change the way autistic individuals are viewed and treated by shifting the current paradigm away from a deficit model.

Examining the Relation Between Dietary Patterns and Positive Psychological Functioning

Audrey Wallace, Alex Edwin, and Sarah Siebers

Faculty Mentor: **Dr. Urska Dobersek**

While many individuals abstain from meat consumption to improve their psychological health, dietary restrictions are associated with poorer mental health such as depression, anxiety, and self-harm. However, few studies examined diet-health relations from a positive perspective. Therefore, the purpose of this study was to examine the relation between meat consumption and positive psychological outcomes, including life satisfaction, happiness, and mental toughness between males and females. Using convenience sampling, 11 undergraduate students ($n_{\text{males}} = 4$, $n_{\text{females}} = 7$) between 18 and 33 years of age ($M_{\text{age}} = 20.4$, $SD = 4.3$) were recruited via Psychology Subject Pool at the University of Southern Indiana. Via an online survey hosted on Qualtrics, they completed a Demographic Questionnaire, the Satisfaction with Life Scale, the Subjective Happiness Scale, and the Sports Mental Toughness Questionnaire. We hypothesized that males who are meat consumers would report higher life satisfaction, happiness, and mental toughness compared to females who are meat consumers. An independent samples t-test suggested a significant difference between males and females on mental toughness, where males ($M = 43.5$, $SD = 2.08$) scored higher on mental toughness compared to females ($M = 39.43$, $SD = 3.15$), $t(9) = 2.285$, $p = .048$, $d = 1.43$. All other comparisons (i.e., satisfaction with life and happiness between male and female meat consumers) were not statistically significant. Reasons for the findings, their relevance, and implications for further research on the relation between meat consumption and psychological well-being between males and females will be discussed.

Conflicting Injunctive and Descriptive Norms in the Educational Setting

Sabrina Yamashita

Faculty Mentor: **Dr. Julie Eyink**

When instructing a course, teachers strive for student participation. However, this is a very difficult goal to achieve! One way teachers could attempt to change participatory behavior is through the use of social norms, or the unwritten rules of behavior that influence our actions. We can separate norms into two

categories - injunctive and descriptive. Injunctive norms are perceptions of behaviors that are approved by others, while descriptive norms are perceptions of behaviors that people actually do. Past research found that one salient norm in the situation is likely to drive behavior. However, our past work (Eyink et al., in prep) looked at different norm combinations and found that a conflicting combo of high injunctive and low descriptive had the biggest impact on participant behavior. Our goal is to extend what was done in our past study to an educational setting, in order to determine what level of conflicting norms works best for enticing students to participate in a course evaluation survey. To examine if conflicting norms affect student participation, we sent out an email to students describing an opportunity to provide midsemester feedback in a large introductory psychology class. Students received one of three email types manipulating social norms about providing feedback: 1) high injunctive, high descriptive, 2) high injunctive, low descriptive, and 3) high injunctive, no descriptive. All students received the same high injunctive information describing reasons why students should complete the important survey. Students in the high descriptive condition also received a statement stating more than 83.11% of students completed the survey last semester. Finally, students in the low descriptive condition received a statement stating only 43.11% of students completed the survey last semester. In their designated email, students could click on a link to take them to the course evaluation survey. If students started the course evaluation survey, they were coded as having participated. We also recorded how long (in seconds) each participant spent on the evaluation survey. To analyze our data, we first ran a Chi-Squared analysis to see if our norm manipulation affected whether students participated vs. didn't participate in the course evaluation. The proportion of students who did vs. didn't participate did not differ by norm type, $\chi^2(2, N = 149) = 0.13, p = .937$. Next, we used a one-way ANOVA to test if our norm manipulation had an impact on survey duration. There was not a significant effect of our norm manipulation on survey duration, $F(2,20) = 0.48, p = .626$. For future studies we will consider tracking emails to see which participants opened emails and which did not, so that those who did not open the emails would not be included in the data analysis. Also, there is the idea of notifying the participants with the statements in person rather than through email, so that we don't have to consider who saw the email or not; furthermore, increasing our sample size.

Plan to Attend

The 2024 Endeavor Undergraduate
Research and Creative Work Symposium
University Center

Thursday, April 11, 2024



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