Undergraduate Research Conference 2023

Poster Abstracts

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Abbey Johnson and Enmin Zou

Mentor: Dr. Enmin Zou

Nicholls State University

Impact of prolonged exposure to CO 2 -acidified seawater on the properties of crab shell, a biological concrete

Crab exoskeleton is a bioconcrete consisting of an organic matrix that is embedded in carbonate salts, predominantly calcium carbonate. This carbonate salts-based exoskeleton is potentially adversely impacted by acidification. A recent study found that exposure of soft-shell blue crabs, Callinectes sapidus, to CO 2 -acidified seawater for 7 days can make crab shells sturdier, due partially to increased mineralization. However, the postmolt mineralization lasts for about two weeks in blue crabs. Therefore, a long-term exposure study is warranted. This study seeks to examine the effects CO 2 -driven acidification has on the exoskeleton of Callinectes sapidus after prolonged exposure of soft-shell crabs to CO 2 -acidified seawater for 14 days. Two groups of at least 10 soft-shell blue crabs each will be exposed to control seawater at pH 8.2 and CO 2 -enriched seawater at pH 7.8 for 14 days. At the end of exposure, carapaces of all the survivors will be harvested, calcium and magnesium content will be analyzed, and the mechanical strength of crab shells will be tested. Allowing the crabs to endure acidic exposure for a longer duration could reveal a limit to the amount of mineralization that can occur. The findings can help further understand how exactly ocean acidification is impacting blue crabs.

Abbey Poirier

Mentor: Ronald Dore'

University of Louisiana at Lafayette

Attracting Students to the University of Louisiana at Lafayette

Every university wants to attract, enroll, and graduate as many students as possible. However, this is harder than it seems. High school students receive an influx of university packets in the mail advertising that they are their best option for an education. So, how will universities win this tug of war-with other universities who are pitching the same thing to high school students? These students are overwhelmed and asking themselves "Is this the right college for me?" Colleges and universities try their best to show off what they have that others don't but is this enough to increase their enrollment? My research focuses on examining previous research related to strategies to help universities attract and enroll students, especially the University of Louisiana at Lafayette. Not only is it important for the University of Louisiana at Lafayette to recruit students but they need to graduate these students as well. The universities don't want students to come for 1 year or maybe 2 years and then either drop out or transfer. To help retain students, universities should do their best to make their school feel like a community, so students feel welcomed and eager to return for the next semester. Increasing honor programs can help universities recruit better students who are more likely to graduate and return for a master's degree. One of the best strategies that I found in my research is using faculty, current students, and alumni to recruit high school students since they know the quality of education at their university. I also discovered the impact of the increase in enrollment by having high school/university partnerships. Universities participating in dual enrollment programs with local high schools help their chances to connect with students more readily, which could be the connection that the students need to choose one university over another. Further research will help show the benefits of reaching students early in high school and expanding UL's dual enrollment program into parishes outside Lafayette to reach students in more portions of the state.

Abbey Poirier

Mentor: Dr. Megan Breaux

University of Louisiana at Lafayette

Word Unleashed: Creativity Breaking Free

The purpose of my presentation is to showcase my writing from the EDCI 360 course, Writing Across the Curriculum. In this course, I have written poetic, creative, and narrative writings. I will be compiling all of these works of literature to showcase the different types of writing that I have written in this class. The first half of this course focuses on future teachers being the writer so they can understand what it is like to be the learner before they become the teacher. The main purpose of this is so we as teachers can understand the process that our students will go through when they write. By doing this we can effectively help our students since we have gone through the writing process as a student and not as a teacher. As teachers will want our students to be proud of what they write and to be able to showcase their work. To fully understand the importance of why students should be proud and showcase their work I will be showcasing my own from the EDCI 360 course. This is also a great opportunity for others to see the initiatives that the Department of Educational Curriculum and Instruction are taking to develop teachers as writers. By showcasing my work, I hope to help others understand the importance of writing and how we can express ourselves with the words we write. The writing that I will be including in my presentation will range from poetry and other creative writing that has been written. In my presentation, there will be collections of episodic, golden shovel, and free verse poems. With this presentation, I hope to show the importance of writing and how anyone can be a writer.

Jacob Stagray, Alexandra Chistoserdov, Jordan Richard, Presley Walls, Abbi Faul, Glenae Nora, Alex Esteve, Debbie Rogers, and Karen Muller Smith

Mentor: Dr. Karen M. Smith, Jacob Stagray

University of Louisiana at Lafayette

Effects of Fibroblast Growth Factor Receptor 1 Signaling Interactions and Dietary Treatments on Hypothalamic Tanycyte Development

Fibroblast Growth Factor Receptor 1 (FGFR1) is a widely expressed receptor that influences signals for cellular growth, proliferation, and transcription activation. FGFR1 has previously been shown to be highly expressed on Tanycytes. Tanycytes are a specialized type of astrocyte found in the third ventricle (3V) of the brain. Tanycytes have been shown to be involved in regulating hormones that govern appetite/feeding behaviors; such as ghrelin or leptin. Tanycytes are subdivide into two subtypes: α tanycytes and β tanycytes. α tanycytes regulate hypothalamic nuclei activation, especially those involved in feeding behaviors, while β tanycytes are responsible for sensing metabolites like glucose. Our lab has previously found that a fgfr1 (gene) conditional knockout (cKO) of the results in decreased β tanycyte process length. This has potential implications for the tanycytes abilities to interact with glucose related metabolites. Simultaneously, cKO also demonstrate a decreased ability to tolerate elevated glucose concentrations after being placed on a High Fat Diet (HFD) for a 30-day treatment duration. Overall, our previous findings for glucose monitoring after 30-days of treatment suggested that the mice were not sufficiently induced at becoming diabetic after 30-days on the treatment. This diet has previously shown to induce diabetes after 6-8 weeks of treatment.

A typical glucose curve after glucose administration follows a pattern of spiking rapidly within the first 15 – 30 minutes following injection, then continually decreasing over a period of 4 hours to its initial levels before injection, displaying an insulin response to the increase of glucose in the blood. In a diabetic or pre-diabetic individual, however, insulin response is impaired, and the cells do not respond to it as well as in a non-diabetic individual. As a result, the glucose curve of a diabetic individual is much broader than that of a non-diabetic individual.

We hypothesize that overall, a HFD treatment duration of 60-days will result in increased broadening of glucose curves. These broader glucose curves will be indicative of a more diabetic mouse. Additionally, we hypothesized that the FGFR1 cKO mice will have an increased impairment of the typical physiological glucose/insulin response pathways. As a result, the

FGFR1 cKO are anticipated to have a broader glucose curve when compared to the control mice. This would be indicative that a FGFR1 cKO would result in more diabetic mice when compared to the CTRL mice. To test this, FGFR1 cKO mice were placed on a diabetes-inducing HFD for 60-days to observe the effect of FGFR1 as well as a HFD on metabolism, feeding behaviors, fat storage, and tanycyte morphology. We will also determine whether prolonged HFD consumption causes more dramatic diabetic effects as compared to the previous 30-day data.

When Compared to the 30-day glucose curves, the 60-day glucose curves spiked to higher values. This means that after HFD treatment for 60-days, the typical insulin response is less effective and delayed within the first 30 minutes following glucose injection. However, the 30-day glucose curves were broader with blood glucose levels took longer to return to their initial levels before injection. This is suggestive that HFD treatment for 60-days results in increased alterations to the typical insulin response time following the 30-minute time point. Contrary, after 30-days of HFD treatment, the efficacy of the insulin response is more controlling prior to the 30-minute time point but is also overall less effective in successfully returning blood glucose concentrations to their initial levels. On average, FGFR1 KO mice glucose curves across all challenge days after HFD treatment resulted in higher peak values compared to their control littermates. This suggests that a FGFR1 cKO on a HFD treatment of any duration results in a more diabetic individuals when evaluating the approximate time point when the insulin response is effective in reducing the peak values 30-minute timepoint. Worth mentioning, while there wasn't a distinct difference in percent of adipose weight in FGFR1 KO and control females, there was a difference in percent of adipose weight in FGFR1 KO and control males, where FGFR1 KO males had a decreased percentage of adipose tissue weight as compared to the control males. Across the 60 days of HFD treatment, females generally gained more weight than males. However, FGFR1 KO mice gained less weight than their control counterparts. This is especially notable in males, since FGFR1 KO males lost weight in total, while control males gained weight. However, despite females gaining more weight as compared to males, they, on average, consumed less food per day. It should also be noted that food consumption decreased in both genders through the 60 days of HFD treatment. In the future, we will stain brains from all four mice categories to observe the presence of tanycytes, stem cells, and potential for subsequent cell differentiation.

Allana Judge, Kathryn Walker, Alessia Corami

Mentor: Dr. Alessia Corami

University of Louisiana at Lafayette

Elevated Concentrations of Microplastics and Heavy Metals in Necrosols

Soil is a vital part of our environment. From the food we eat to the material we build upon, it provides us with many elements we need to live. Cemeteries are a possible host to contaminants that can affect our soils. Microplastics and heavy metal contamination are the main considerations when observing graveyard soils. Paints, wood preservatives, varnishes, and sealers are all used in casket preparation. These materials are not immune to degradation processes and may be leached into surrounding soils and water tables. Overall, this causes an increase heavy metal concentrations, specifically As, Cu, and Cr, in the soil. Heavy metals in soils can contaminate food and water supplies as well as stunt growth of plants and harm soil microorganisms. Microplastics (plastics less than 5mm in size) may pose a concern to the soil environment as well. Plastics do not decompose in the environment, instead they continuously break into smaller fragments. Faux flowers are commonly found in cemeteries and, without proper cleanup, can degrade into secondary microplastics. Microplastics absorb significant amounts of sun radiation making them hotter than surrounding material. This can lead to intense heating and drying of soil and decline in plant growth and microbial activity in soils. The extent of the heavy metal hazard is determined by XRF analysis of composite soil samples taken at multiple graveyards in Lafayette, Louisiana. Analysis of microplastics includes: density analysis, extraction, and microscopy examination. Studying necrosols is important because of the potential effects on local environments and human health. The impact that cemeteries may have on the surrounding environment is not well researched and it is possible that more oversight is necessary when it comes to the placement of cemeteries and how they are managed.

Amelie Caillouet, Tristen Brown, Kaeleigh Difloure

Mentor: Ismatara Reena, Sumona Mumu

University of Louisiana at Lafayette

Assess the eHealth Literacy (eHL) of College Students Attending 4-year University in the Southeastern U. S.

As the use of the internet grows more prevalent, so does the practice of seeking health information online. eHealth literacy (*eHL*) is the ability to navigate, understand, and utilize online health information and resources. *eHL* has emerged as a pivotal skillset in the digital age and the era of misinformation and disinformation. The purpose of this study was to assess *eHL* among college students attending a 4-year college in the Southeastern United States. A purposeful sample of 228 students completed an online survey which included demographic information and the eHealth Literacy Scale (eHEALS). Descriptive and inferential statistics were used to analyze the data. The analysis revealed that age significantly influenced *eHL* scores, with participants aged 18-21 years scoring lower than those aged 22-29 and those 30 or older. Gender, race, major, academic class, and first-generation college student status did not show significant impacts on *eHL* scores.

Keywords: eHealth literacy (*eHL*), eHealth, health literacy (HL), college students, internet, healthcare, online health information

Andre Broussard, Ron West, Justin Landry, Romme Felton, Ceren Engin, Sulaiman Afolabi

Mentor: Dr. Hsu

University of Louisiana at Lafayette

Online management system of State Parks

Scope of project:

This project is to develop a web application for displaying information regarding park events for state and local government parks. This will include events taking place in bookable areas and general information about the event that would be relevant to users. We plan to develop a user database for users to be able to login to submit events for approvals.

Business Case:

The proposed online management system aims to centralize and simplify the process of displaying information related to events at state and local government parks. This system will enhance user experience by offering a platform where users can access details about events, especially in bookable areas.

The stakeholders for this project would be event organizers, park visitors, and park administration. It will benefit the user experience of park users and allow for increased efficiency for administration. This also allows for open transparency of what is happening in the park for parkgoers to be aware of.

Task #	Milestones	Task Priority	Task Description	Estimation	Assignee(s)
1	Initial development of application	High	The framework of what the final product will be is developed	5 hrs	Everyone
2	Login System	High	Develop a system for user to register and login to the application	5 hrs	Ron, Andre
3	Display Park events	High	Find a framework or api to display park events and information	5 hrs	Romme, Justin

			for users to see.		
4	Refine look of web application	Medium	Make the application more user friendly and nicer to look at.	3 hrs	Sulaiman, Ceren
5	Bug fixing	Medium	Fix any bugs that may occur from refinements and ensure everything is working correctly.	3 hrs	Ron, Romme
6	Documentation of how to use it.	Medium	Document how to use and how to improve the application in the future	3 hrs	Andre, Justin
7	Prepare presentation of web application	Low	Get everything prepared to present both what and how to use the web application for the final presentation.	1 hr	Sulaiman, Ceren

Conclusion:

The online management system will offer an immense value to event organizers, park administration, and visitors. With a clear objective, structured implementation, and an understanding of associated risk and benefits, this project promises a better and more organized way to manage and attend events at parks.

Andrew Godke

Mentor: Ronald Dore'

University of Louisiana at Lafayette

How schools can Better Prepare Students for Successful and Fulfilling Lives

The purpose of this study is to examine previous research related to How Schools can Better Prepare Kids for Successful and Fulfilling Lives. What can schools do to help students better prepare for their future? Schools are a place for many students to flourish and become successful members of society. It is our job as teachers to understand and help prepare students for the future that lies ahead. The problem shows through when you look at the copious amounts of students who graduate with several qualifications but, continue to lack the basic knowledge that is crucial if they want to survive adulthood. When you look at the average graduation rate in high school is 86% as of 2022. When you look at the average graduation rates it makes many think that there is no problem for most students getting their diplomas. The problem is that 41 % of students drop out of college. That is almost half the number of students that enroll in college. The four ways schools can better prepare kids is to foster a supportive environment that promotes strong relationships among staff, students, and families. Implement meaningful. Engaging instructional practices that develop students' ability to manage their own learning. Develop habits, skills, and mindsets that build students' social, emotional, and academic competence. Create an integrated system of school support that includes extended learning opportunities and community partnerships. Schools need to insure they use this properly so they can teach kids the importance of respecting their peers and being better people as well-being to understand that their actions do have consequences. This will also help boost the overall morale of the classroom and the drive that many of the students will want to learn in. Students will also have more resources at their disposal with tutoring and more. Schools need to be able to properly implement this in all their schools in order to help many of the students to be better people and have the drive to be successful members of society.

Dr. Sheng Chen, Dr. Arun Lahkotia, Austin Bryant

Mentor: Dr. Sheng Chen / Dr. Arun Lahkotia

University of Louisiana at Lafayette

ACADIANA: Annotating Code for Assured Data Intent to Avoid Novel Attacks

The ACADIANA Project, a collaborative initiative between Assured Information Security, Inc. (AIS) and the University of Louisiana at Lafayette, focuses on mitigating the inherent limitations of modern programming languages, operating systems, and architectural abstractions in ensuring adequate confidentiality and integrity protections, with a specific emphasis on the Rust programming language. This project proposes a solution through the implementation of granular annotation capabilities, enabling software developers in Rust to specify the protection requirements for various code elements, such as variables, buffers, scopes, basic blocks, functions, and entire programs. ACADIANA introduces new runtime protection mechanisms, enforced by a hypervisor, that safeguard data integrity and confidentiality, based on these developer annotations. In doing so, ACADIANA presents a holistic approach to bolstering data security within the Rust programming paradigm.

Bailey Meche, Isaac Kulp, Kevin Zito, Ross Chiquet

Mentor: Dr. Kevin Zito

University of Louisiana at Lafayette

Solving Systems of Differential Equations with Integrable Coefficients

We establish a technique for solving systems of ordinary differential equations (ODEs) with integrable functions as coefficients using semigroup and Laplace transform techniques. The Peano-Baker Series method is leveraged to convert this problem into an inhomogeneous initial value problem. We improve this approach by overcoming assumptions, improving computation, and allowing for arbitrarily accurate estimates. Examples are provided to demonstrate our solution.

Bailey Meche, Nathan McEntire, Melissa Hall, and Scott Richter

Mentor: Dr. Scott Richter, University of North Carolina Greensboro

University of Louisiana at Lafayette

Effect of unequal variance on statistical tests for mixed paired and two-sample designs

Choosing the right statistical test is critical for designing a study, especially when equal variance cannot be assumed. The standard statistics for mixed paired and two-sample designs include the paired and independent t-tests - both of which do not incorporate all observations. Several improved statistics have been proposed to utilize all available data. However, most of these improved approaches have not been tested under the effect of unequal variance. Several tests were compared under this condition. To address the limitation of the assumption of equal variance, this work develops a test for the effect of unequal variance and compares its performance with existing tests, contributing to a more complete understanding of statistical methods in the presence of unequal variance. Two tests are recommended under certain conditions after the performance is observed.

Bailey Nguyen and Shuichi Sato

Mentor: Dr.Shuichi Sato

University of Louisiana at Lafayette

Potential Relationship Between p38 and Anabolic Signaling Female Cachectic Mice

Cancer cachexia is associated with catabolic conditions that cause skeletal muscle wasting. Research has indicated the presence of sex differences in the development of cancer cachexia and increase in muscle loss. In male mice, the p38 mitogen-activated protein kinases (MAPK) are known to play a role in the progression of cancer cachexia. However, their role in female mice remains unclear. The purpose of the study was to observe the p38 activity in female cancer mice. We found that there may be a negative relationship between p38 and 4EBP1 (eukaryotic initiation factor 4E binding protein, a molecule involved in maintaining and increasing muscle mass). This data indicates that an increase in p38 activity could potentially reduce anabolic signaling contributing to muscle wasting.

Boneze Chika, Clyde Courtright, Hunter Ray, Cameron Hewitt, Andre Garcia, Jonathan Kelly

Mentor: Nick Lipari

University of Louisiana at Lafayette

Online donation system for The Acadian Center for Arts in Lafayette

The creation of a tailored Donation/Grant Web Application for The Acadian Center in Lafayette, Louisiana, is set to redefine the landscape of arts philanthropy. This innovative platform offers user-friendly, secure interfaces for both donors and grant seekers. Donors can seamlessly support The Acadian Center and other local arts projects, thanks to a robust payment gateway ensuring transaction security. Artists and organizations can navigate a streamlined application process, promoting transparency and collaboration. Leveraging advanced technology, the application employs data analytics and AI to identify high-impact projects. Designed for scalability, it caters to the unique dynamics of Lafayette's arts community.

This web application cultivates a sense of community, facilitating connections and collaborations among donors, artists, and arts enthusiasts. This marks a pivotal moment in the evolution of Lafayette's arts ecosystem, fostering growth, transparency, and community engagement. It is poised to invigorate the local arts scene and enhance The Acadian Center's pivotal role in shaping cultural vibrancy in Lafayette, Louisiana.

Bradley Bouton, Kevin Torgersen, James Albert

Mentor: James Albert

University of Louisiana at Lafayette

3D Geometric Morphometrics Reveals Ontogenetic Patterns in Hypentelium Nigricans

Hypentelium nigricans, the northern hog sucker is a species in the family *Catostomidae*. Throughout an individual's life, their body grows at different rates. Using 3D geometric morphometrics we compare the body shape of 23 different specimens ranging from juvenile to adult sizes. Landmark-based geometric morphometrics are used widely in the biological sciences to study the evolution of shape and compare body structures. 2D geometric morphometric analyses are most common as they can be performed on readily available photographs of specimens or structures. 3D geometric morphometric methods are recently becoming more popular, however, the collection of 3D data for these analyses is much more complex and often requires expensive equipment (ex. computed tomography). Recent advances in 3D photogrammetry technology have lowered barriers to create and analyze true 3D models of biological specimens at low cost. We use these models to better understand the ontogeny of this species.

Brielle Jones, Kinsey Hatfield, Matthew Arcona

Mentor: Dr. Hung-Chu Lin

University of Louisiana at Lafayette

Flourishing Variables in a Normative Weight Sample and Overweight Sample of Adolescents: A Comparative Analysis

Childhood obseity is associated with a multitude of negative physical and psychological outcomes later in life (Guh et al., 2009). Most common interventions include changes in diet, exercise, and pharmocological (Miguel-Etayo et al., 2013). There is evidence to suggest that there are psychological factors that can also impact weight (Stice et al., 2005). One psychological factor previously linked to obesity, is parent-reported florusihing of the child (Gil et al., 2019). The current study seeks to investiagte the significance of flourishing variables' (interest in learning, staying calm when facing challenges, and finishing tasks) impact on children who were reported to be overweight verses those that were reported to be of normative weight. A sample of 18328 parental responses about their children aged 10 to 17 was gathered from the 2021 National Survey of Children's Health (NSCH) and analyzed. Children classified as overweight performed significantly lower than the normative weight sample in three flourishing variables: their ability to finish tasks they have started, $t(18326) = 11.84$, $p < .0001$; their ability to stay calm and in control when facing a challenge, $t(18326) = 11.06$, $p < .0001$; and their interest in learning new things, $t(18326) = 3.49$, $p = .0005$. These results suggest there is an association between the psychological construct of flourishing and whether or not a child is reported to be of noramtive weight of not. Future research should investigate the causal reltionship between these psychological contructs and BMI in adolescents.

Bryce Moulton

Mentor: Dr. Monica Embers

University of New Orleans & Tulane University

Tick Survey Along the Gradient of Land Usage in Sierra Leone

This research project investigates the diversity and abundance of tick species in relation to different land uses in Sierra Leone. This is an exploratory public health study to assess the tick species present within the Eastern and Southern Provinces of Sierra Leone. Across two provinces and four different chiefdoms flagging was done to collect ticks and identify them to species level. Sampling areas were determined based on agricultural land use type and specifically based around the major economic crops of their respective area. The core question of "does land use correlate with differences in species diversity and density of ticks within rural Sierra Leone?" was answered by assessing ten relevant environmental variables for every ten meters across the 7,220 meters sampled across the country. Statistical tests indicated that there were a number of expected correlations, most importantly the presence of livestock or domestic animals in proximity to the agricultural plots had a positive correlation with tick presence.

Cade Hontiveros

All authors: David J. Shoemaker1,2; William E. Holmes1; Daniel D. Gang1,3; Mark E. Zappi1,2

Mentor: Dr. William Holmes

University of Louisiana at Lafayette

Chemical Analysis Utilizing Inductively Coupled Plasma-Optical Emission Spectrometry for the Performance Evaluation of the Capture of Lithium from Process Waters Using H2TiO3 Adsorbent

Lithium and its compounds are increasing in demand in accordance with the new technology associated with this metal such as heat-resistant glass and ceramics, lubricants and greases, pharmaceuticals, but most importantly for lithium-ion batteries. Due to the significant technological value associated with lithium, and increasing economic value, it has been deemed a critical metal.

The majority of lithium, globally, is concentrated in secondary sources such as salt lake brines, with only about twenty percent contained in lithium ore. For further advancement of lithium-associated technology, it is crucial to explore accurate methods for recovery, separation, and purification of lithium from secondary sources (e.g., salt lake brines, seawater, and well water).

One method to recover lithium from these sources is utilizing an adsorption and ion exchange process. Absorption is a promising method for lithium recovery because it has a high selectivity for lithium ions over other ions present in the adsorbate solution, and it can be performed at low temperatures, which reduces energy consumption and costs. One promising lithium-ion sieve that has gained much attention from researchers in recent years is hydrogen titanium oxide (H_2TiO_3) due to its stability, high adsorption capacity, and recyclability.

The best methods for the quantification of lithium recover results must also be determined. In this work, the concentration of lithium is measured using Inductively Coupled Plasma-Optical Emission Spectrometer (ICP-OES). ICP-OES is a powerful analytical technique used to determine concentrations of trace metals in solution. The plasma within the instrument is used to create a high-temperature and high-energy environment. In this environment, lithium ions are excited and then, once they return to a ground state, emit a photon which we use to identify the element due to its characteristic wavelength. This machine is effective in identifying lower concentrations all the way to parts per billion of metals in solutions.

As with all analytical techniques, quality control is paramount to obtain accurate and reliable results. With regards to ICP-OES, calibration must be performed using samples with known concentrations, blank samples must be tested periodically to detect background signal levels in the instrument, quality control standards must be tested to ensure accuracy and precision of the instrument, and regular, general maintenance must be performed on the instrument. If quality control guidelines are not maintained, the accuracy and precision of results obtained cannot be ensured. One such instance of this relates the environment within the ICP-OES to the accuracy of the calibration curve.

Caitlyn Rogers

Mentor: Dr. Ed Bush

University of Louisiana at Lafayette; Louisiana State University

Using Tillandsia Recurvata as a Biological Indicator to Monitor Air Pollution and Oil Retention

Air pollution is defined as the presence of a substance in the atmosphere that is harmful to human health, living things, and/or has a negative impact on the environment. A plant such as *Tillandsia recurvata*, ball moss, could be used as an inexpensive biological indicator for urban pollution. The purpose of this research was to determine if ball moss could be used as a biological indicator of urban pollution and retain oil pollution. Multiple sites were identified and grouped by vehicular traffic frequency (counts) using the Louisiana State Department of Transportation and Development (LaDOTD) traffic data to randomly select five low (0.0 - 7000), and five medium/high frequency (7001 to >14,000) traffic counts in locations within Baton Rouge, La. city limits. Differential analysis determined that harvested ball moss tissue levels from areas with low traffic (<0.05 level) contained lower S concentrations than plants tested from high traffic counts. In a second study, dried *Tillandsia recurvata* plant tissue accumulated greater oil weight than absorbent paper towels. *Tillandsia recurvata* absorbed and/or retained oil at a greater ratio of oil than its own mass. Therefore, the results of each experiment indicated that *Tillandsia recurvata* may successfully function as a biological indicator and serve as an oil retentionist on a small-scale test. Further research is needed on a larger-scale area to confirm the efficacy of ball mosses for controlling water pollution *in-situ*.

Hannah Bourgeois, Rebecca Delcambre, Cantika Nasution, & Michaela Middleton

Mentor: Dr. Hung-Chu Lin, Anna Romero

University of Louisiana at Lafayette

Victims of bullying: Correlates of being a bully, ADHD symptom severity, and ACEs

Introduction: Research indicates that attention deficit hyperactivity disorder (ADHD) poses risks for children to be marginalized from their peers (Simmons & Antschel, 2020). While research underscores the link between ADHDand bullying behavior (Murray et al., 2021), evidenceis limited supporting the link between ADHD and being a victim of bullying. Research has also indicated the link between Adverse Childhood Experiences (ACEs)and becomingvictims of bullying or bullies themselves (Kennedy et al., 2021). This study aims to examine the associations of being a victim of bullyingwith being a bully, ADHD, and ACEs.

Method: A secondary analysis was performed using the National Survey of Children's Health data collected by the U.S. Census Bureau in 2021.A total number of 106,000 parents reported information about their children (ages ranged between 6 and 11).

Results: The result indicated that children on average experienced being bullied zero to two times in the past year. The average number of ACEs in children averaged between zero and one. Frequency of being a bully was between zero to two times in the past year. The average ADHD symptoms were mild. Being a victim of bullying was significantly correlated with the number of ACEs ($r = .22$, $p < .0001$), frequency of being a bully ($r = .47$, $p < .0001$), and ADHD symptom severity ($r = .26$, $p < .0001$).

Conclusion: The findings suggest that interventions aimed at protecting children from bullying victimization may entail education targeting bullying, ACEs prevention, and ADHD symptoms.

Caroline M. Dalton, Kiara K. Davillier, Hailey Dunagin, and Amy L. Brown, PhD

Mentor: Dr Amy Brown

University of Louisiana at Lafayette

Perceptions of Male Rape Victims Dependent on Perpetrator's Gender

Introduction: For rape cases to be considered valid, victims must be seen weak and powerless, and the attacker must physically force themselves onto said victims (Javaid, 2016). Since the vast majority of female on male rape cases involve the perpetrator utilizing some form of coercion or manipulation rather than any physical force, these rapes are more often perceived as consensual (Krahé, 2003). This may explain why only 5 out of 40 male victims report their assault to the police (Fisher & Pina, 2013). This study's purpose is to determine how the perception of male victims is influenced by the gender of their rapist.

Methods: Participants (N = 258; M age = 19; 68% women, 3.8% transgender and non-binary) were college students from the Psychology Department Subject pool. Participants were randomly assigned to read one of two vignettes that involved sexual assault between two partners (Alex and Luke). In both versions, Alex was the aggressor and Luke was the victim; in one scenario Alex was presented as a woman, and in the other Alex was presented as a man. After reading the story, the participants answered questions about their general perception of the characters and the sexual assault. Factor Analysis was used to identify two sub-scales of the measure: victim blame (3 items) and perpetrator blame (3 items). Surveys were completed through an online survey, via Qualtrics.

Results: The t-test revealed no differences in victim blame in terms of the perpetrator. However, female participants blamed the victim less (t(88) = -3.45, p. <.001) and the perpetrator more than men did (t(106)= 2.75, p <.01).

Discussion: The results from our study showed that participants did not blame the victim or perpetrator any differently depending on the gender of the rapist. However, there was a significant difference in the responses regarding the gender of the participants. In both scenarios, male participants showed harsher judgements to the victims and more lenient judgements to the perpetrator than the female participants did. This gender difference in the participants aligns with previous studies that show that females tend to display more empathy than males (Kamas & Preston, 2021; Chen et. al, 2018). The lack of difference in results between the two vignettes

may be due to both perpetrators using coercion to rape their romantic partners, rather than force against a stranger.

Dr. Patrick J. DiMario PhD., Maryam Ghasemzadeh, Claire Brescher

Mentor: Dr. Patrick J. DiMario PhD

Louisiana State University Agricultural and Mechanical College

The Intracellular Localization and Function of the Stress Response Kinase c-Jun Amino-Terminal Kinase in Drosophila melanogaster

Nucleolar stress results from a malfunction in ribosome biogenesis leading to human diseases collectively known as ribosomopathies. Inducing nucleolar stress in the model organism Drosophila melanogaster can serve as a model system to study these ribosomopathies. Nucleolar stress can be induced in Drosophila by knocking out the gene encoding the ribosome assembly factor referred to as the Nucleolar Phosphoprotein of 140 kDa (Nopp140). Using western blotting techniques, we know that the stress response kinase c-Jun N-terminal Kinase (JNK) is up-regulated upon nucleolar stress, but the precise intracellular function and localization of JNK in normal, non-stress conditions versus nucleolar or heat sock stress is largely unexplored. Using transgenic fly lines expressing JNK tagged with GFP, we first explored the intracellular location of JNK-GFP upon heat shock stress. Under normal, non-stress conditions, JNK-GFP located to the perinucleolar space to form a bright ring around the nucleolus. An unknown nuclear body is visible in the polyploid cells of second and third instar larvae under normal, non-stress conditions. However, under adverse heat shock conditions, JNK redistributed from the perinucleolar space into the nucleolus. Currently, we are examining JNK localization upon nucleolar stress. Investigating JNK function and pathways is vital in our understanding of major biological processes such as the inflammatory response, cell proliferation and differentiation, tumorigenesis, and ribosome biogenesis. Therefore, studying the subcellular activation of JNK under induced stress conditions will help the scientific community gain a better understanding of the root cause of human ribosomopathies and help clinicians formulate better treatment plans for their patients.

Kirsi S. Michael and Cody J. Smith

Mentor: Dr. Brooke Breaux

University of Louisiana at Lafayette

Who Done It: William or Winston? The Hidden Biases Revealed by Name Popularity and Socioeconomic Status

Evidence suggests that people with unpopular first names (versus popular names) are more likely to commit crimes (Kalist & Lee, 2009); there is also evidence to suggest that people who have a lower SES (versus higher SES) are more likely to commit crimes (Heimer, 1997). Correlational evidence does not allow researchers to determine whether having an unpopular first name or a lower socioeconomic status (SES) are factors that cause a person to engage in criminality. However, we can explore if these factors influenced students' perceptions of criminality.

We used a fully within-subjects experiment and presented participants with stories about a crime in which we manipulated two variables: the popularity of the primary suspect's first name (popular or unpopular) and the extent to which details about the primary suspect suggest a particular SES (low or high). We used a convenience sample consisting primarily of our department's undergraduate students and have currently obtained a partial data set of 97 participants.

Using a 2 within-subjects (Name Popularity: popular, unpopular) x 2 within-subjects (SES: high, low) repeated-measures MANOVA, we determined that there were no main effects for name popularity or SES. However, there was a significant cross-over interaction effect $(F(1,96)= 6.98, p<0.010)$.

This interaction effect means that when a suspect was described as having low SES, having an unpopular name resulted in higher ratings of criminality; however, when a suspect was described as having high SES, having a popular name resulted in lower ratings of criminality. If these variables alter perceived criminality in predictable ways once a full sample is obtained, then providing jurors with this type of information during criminal trials could invite application of the fundamental attribution error, resulting in an increase in wrongful convictions and undermining the concept of "innocent until proven guilty."

Colette Mouton, Gabrielle Mellor, and Don Zhang

Mentor: Don Zhang

Louisiana State University

Taking Risks, Chasing Smiles: Exploring the Correlation Between Risk-Taking and Wellbeing

Despite recent research supporting the notion that risk propensity is correlated with both happy (e.g., high extraversion) and unhappy (e.g., low conscientiousness) personality traits, the role of risk propensity as a personality predictor of happiness has been often overlooked in sychological research (Anglim et al., 2020; Joseph & Zhang, 2020). Relatedly, risk propensity has been found to individually predict both adaptive and maladaptive real-world outcomes separate from the Big Five personality traits (Highhouse et al., 2022). Extending this research, the present study examines the relationship between scores on multiple measures of wellbeing (e.g., Subjective Wellbeing, Psychological Wellbeing, Life Satisfaction) and measures of risk propensity (e.g., DOSPERT, GRiPS). The study sample comprised approximately 500 participants from the LSU SONA participant pool who were tasked with completing a 20-minute Qualtrics survey. To extend upon this research, a meta-analytic investigation is currently underway. This research intends to generate crucial insights into the ways risk propensity is uniquely related to the happiness and wellbeing of individuals and uncover whether risk takers are happier than their non-risk-taking peers.

Colin James Lanclos, Matthew Brennan Spell, Daylen Monteria Scott, Ayodeji Adeyemo, Fiyinfoba Ogunkeye

Mentor: Dr. Nicholas Lipari

University of Louisiana at Lafayette

Currency Exchange Application Development

The project aims to develop a robust web application that empowers users to effortlessly convert US Dollars into other currencies and vice versa while providing a comprehensive suite of financial tools. Central to the application is user registration and authentication, enabling secure access to personalized features. Upon login, users are greeted with a multifaceted dashboard that allows them to manage preferences and access conversion histories.

The heart of the application is a real-time currency conversion tool that utilizes up-to-the-minute exchange rate data, offering historical rates and archiving all user transactions for reference. Users can scrutinize trends and make informed decisions, thanks to graphical trend analysis and predictive algorithms forecasting future exchange rates. These trends are used to predict the future by using past exchange rates to get a prediction on what might be the future rate.

In tandem, the application offers a wealth of information about different currencies, providing insight into their origins, significance, and news affecting their rates.

The user interface is designed to be responsive across various devices, facilitating accessibility from desktops. Robust data security ensures the protection of sensitive financial information, with additional compliance measures for financial transactions. To further enhance the user experience, personalization options, analytics tools, and monetization strategies have been integrated.

This project represents a comprehensive solution for currency conversion, trend analysis, and financial decision support. By seamlessly blending technology, data analytics, and financial expertise, it promises to provide users with a powerful tool for managing their currency exchange needs while staying informed about global financial markets.

Corinne Bosch, Erin McKinley, Kritee Niroula

Mentor: Erin McKinley

Louisiana State University

College Students with Medical Dietary Restrictions Have to Face Additional Challenges When Finding Food That Meets Their Nutritional Needs

Dietary restrictions may be followed because of personal choices and/or medical diagnosis. The literature lacks studies focused on the experiences of college students navigating campus life and handling the effects of restricted eating. The goal of this study was to assess how food allergies, food sensitivities, and/or autoimmune disease affects one's overall health and well-being as a college student.

A sample of 104 undergraduate and graduate students at a large state institution in Louisiana completed a 33-item web-based survey. Participants needed to identify as having dietary restrictions due to food allergies, food sensitivities, and/or autoimmune disease. Items assessed their prioritization of dietary restrictions, commitment to reading food labels, and common symptoms experienced when eating a restricted food item.

People with food sensitives were found to prioritize following their dietary restrictions significantly less often than those with allergies and autoimmune diseases ($p<.001$). This was also reflected in their responses to how often they read food labels, which revealed they were significantly less likely to read labels ($p=0.005$) than those with food allergies. Students with food sensitives were also more likely to report high incidence of gastrointestinal (GI) symptoms like diarrhea, nausea, bloating, gas, and vomiting when eating foods they should be avoiding. Experiencing uncomfortable GI symptoms may interrupt college students' busy schedules causing an increase in stress, embarrassment, money spent on medication to alleviate symptoms, missing class/work, feelings of isolation, and put a strain on intimate relationships. Minimal dietary adherence may lead to an increased risk for decreased GI motility time resulting in malabsorption of vitamins and minerals that could over time cause more serious health issues. The lack of a financial stability, finding the root cause(s) of symptoms, and lack of dietary education could all be contributing factors to why those with food sensitives do not follow dietary restrictions as often.

Lisa Dimaggio, Hayley Howard, Destiny Marvel, and Mary Miller

Mentor: Dr. Mary Miller

Baton Rouge Community College, STEM Division

Can Sediment Analysis be used to further describe species richness of freshwater sponges?

The Louisiana Freshwater Sponge Project (LFSP) is a longitudinal study focused on describing the diversity of freshwater sponge species in Louisiana water systems. Sponges are collected and identified using sponge body and/or gemmules spicules and sequencing the COX-1. From collection sites, sediment samples are obtained and analyzed for spicule identification. The sediment analysis process has provided evidence of a more diverse species of sponges than previous LFSP identification methods. As we analyze the samples, the results confirm the observed and collected sponge samples. Sediment analysis has also added different sponge species at those sites, expanding on the species richness for some locations. Analyzing sediment allows us to confirm the presence of species at a particular site without having to collect sponge samples. This process provides a more expansive picture of the species richness at a site regardless of the seasonal parameters at the time of collection.

Dylan Amiri, Robert Nahouraii

Mentor: Robert Nahouraii

Mecklenburg Neurology

Obstructive sleep apnea (OSA) is a common condition where air flow to the lungs is blocked by relaxing of the throat muscles. The lack of sleep one suffers from due to OSA leads to excessive daytime sleepiness (EDS). Epworth scores measure the severity of EDS and the scale ranges from 0-24 with higher scores ($\geq$10) representing severe EDS that may require an opinion by a sleep specialist. The Apnea-Hypopnea Index (AHI) represents the combined average of apneas and hypopneas that occur per hour of sleep. A mild AHI ranges from 5-15 apnea/hypopnea events per hour, moderate ranging from 15-30, and severe being >30. In the Mecklenburg Neurology patient sample, we observed numerous cases where a severe AHI or Epworth score was reported, but the accompanying variable did not agree in terms of severity. This data was further analyzed to better understand the subjectivity of Epworth scores.

Emilee Brewer, Sita Aggarwal

Mentor: Sita Aggarwal

Southeastern Louisiana University

Role of Botanical(s) on Alkaline Phosphatase Activity

The active chemicals in the plant extracts (such as phytochemicals) halt the progression of cancer cells. There is a historical connection between the treatment of inflammatory diseases with traditional plants. It was proved from various discoveries that approximately 74% of all FDA approved drugs have either a plant origin or these drugs mimic them in one form or another with low toxicity. (−)-Epigallocatechin gallate (EGCG) from green tea is the prime bioactive component, has been shown to inhibit tumor growth and increases bone mineral density and reduces bone resorption. One of the biochemical enzymes "alkaline phosphatase (ALP)" is found in high (809.65 ± 145.97 IU/L) bone tissue of patients with breast cancer. Cancer cells metastasize to bones in both breast cancer and in prostate cancer. Therefore, ALP will be a good biochemical parameter to help in monitoring the cancer progression.

Objective is to standardize an assay for ALP and measure ALP activity. Establishing this method is important because it will be further used to assess the activity of botanical(s) to inhibit the ALP activity.

Research question is "What is the effect of (-)-Epigallocatechin gallate (EGCG), a plant polyphenol flavonoid on alkaline phosphatase activity"? Null hypothesis "EGCG has no effect of alkaline phosphatase activity".

The Benefit(s)- Preventing cancer progression and/or metastasis, by developing new functional foods from natural plant extracts is the key to halt cancer. Chronic inflammation has become a well-accepted risk factor for epithelial-derived malignancies. Therefore, it is important to identify new plant extracts which halt inflammation and cancer progression. This research will help society to learn more on healthy food choices which will lead to heathy and quality lifestyle.

Ethan Littlefield, Jonathan Cuccia, Adam Melvin, and Elizabeth Martin

Mentor: Dr. Adam Melvin

Louisiana State University

Evaluation of Fluid Shear Stress on Triple Negative Breast Cancer Metastasis

Cancer continues to be a leading cause of death worldwide with an approximated 9.6 million cancer deaths annually and 18.1 million new cases recorded each year, with breast cancer being one of the most prevalent. Breast cancer is the most common form of malignant tumor in women accounting for approximately a quarter of female cancer diagnoses. Metastatic tumors are the leading cause of cancer-related deaths. Metastatic cancer cells depart from the tumor origin via the epithelial to mesenchymal transition (EMT). During the transition alterations in expression allow an initial facilitation of departure and an increased capability for invasion and proliferation at the metastatic site. Fluid shear stresses (FSS) are experienced within the vascular system by these circulating tumor cells and are believed to alter such cellular mechanisms. A microfluidic device with serpentine channels is being employed within the lab to exert the hemodynamic forces responsible for FSS upon cells in vitro. The microfluidic platform allows a more consistent magnitude of shear exposure resulting in more accurate results in samples collected. The implementation of a suspension control, rather than an adherent control, allows changes in expression to be more conclusively determined as due to exposure to FSS. Results showed a decreased expression of CDH1 at 24hr and 1-week timepoints, then a decreased expression of FN1 and VIM at 3 weeks. This shows that shear exposure decreases expression of epithelial phenotype related genes short term and a decrease of mesenchymal related genes in the long term. Furthermore, following exposure an increased expression of aberrant COL 5A1 may be a potential cause of metastatic drug resistance. Studying the effects of FSS on breast cancer cells could lead to breakthroughs in treatment for metastatic breast cancer.

Fernando Richardson, Ariel Hanzel, Matt Lavergne, Meka Ekpo, Rajesh Awal, Steven Lin

Mentor: Dr. Sonya Hsu

University of Louisiana at Lafayette

Red's Rewards

This app was created with the goal of rewarding the members of Red's for tasks they participate in every day with the intention of creating an incentive for them to return more frequently. We have used Visual Studio Code, Vue, and Springboot as our stack to create a java project with java, php, css, and sql code as hosting our operations. The system utilizes a user-friendly online application to track and redeem points, fostering a seamless and convenient experience for members. This project presents an analysis of the design and implementation of a loyalty rewards program for a premium gym with a monthly fee of $60, which can be considered slightly high but reasonable in the local fitness market due to the exceptional amenities it provides. The primary objective of this program is to enhance member retention, satisfaction, and overall engagement within the gym, ultimately leading to increased profitability and brand loyalty.

The loyalty rewards program is founded on a tier-based system that allows members to accumulate points by participating in various activities, such as attending classes, checking-in, utilizing personal training services, referring new members, purchasing food and/or merchandise, birthdays, and we will offer a signup bonus. Points can be redeemed for a range of benefits, including food, merchandise, free Personal Training, and having your membership fee waved for one month.

In conclusion, the implementation of a loyalty rewards program for a premium gym offering top tier amenities has proven to be a strategic approach in boosting member loyalty, engagement, and satisfaction. Hopefully attracting new members through the referral program, expanding the gym's customer base along the way. The system's success will be attributed to its convenience, value-driven benefits, and capacity to motivate members, ultimately enhancing the gym's position in the competitive fitness market.

Gabriel White and Tim Clay

Mentor: Dr. Tim Clay

Nicholls State University

Life history characteristics of the invasive Apple Snail *Pomacea maculate*

Pomacea maculata is an invasive species of apple snail that has quickly and effectively established in the freshwater systems of South Louisiana. Since their discovery, giant apple snails have imparted devastating ecological and economic pressures. As eradication is no longer an option, knowing basic apple snail life history characteristics can help us understand their potential range expansion. We have been conducting a temperature dependent growth, survival, and fecundity trial with captive bred individuals. Three tanks each at 20°C, 25°C, and 30°C were set up with heaters and aerators, to which 20 snails (5mm) were added to each. Three times a weekly, snails are fed ad libitum spinach and collards. To track growth, weekly measurements of shell length are recorded for a subset of individuals from each tank. To track survival, mortalities are noted weekly. Our highest temperature treatments have had the highest growth rates and mortalities, suggesting a fitness trade-off. Once snails are mature, the number of clutches produced as well as the number of eggs per clutch will be recorded. Our lab hopes to achieve an apple snail distribution map based on our research of their temperature tolerance to survivability, fertility, and fecundity.

Gabrielle Mellor, Vanessa Burke, Ph. D., Tin Nguyen, Ph. D., Sydney Roux

Mentor: Dr. Vanessa Burke

Louisiana State University

You Work Like a Girl: Understanding Evaluations of Masculinity Violations in the Workplace

In a recent study, Moss-Racusin (2014) uncovered compelling evidence demonstrating that men actively regulate the behavior of other men. Specifically, these findings revealed that men in their study applied punitive measures to their peers when their behaviors deviated from established norms associated with "toughness," "anti-femininity," and "status." While this discovery is pivotal for advancing our comprehension of how gender norms manifest within society, the exploration of this phenomenon within organizational settings, and its implications for both employees and businesses, has remained a neglected area of research. The present study aims to address this gap by offering valuable insights into the functioning of male gender norms in the context of organizations and their subsequent impacts on the well-being and success of individuals and the organizations themselves. To investigate this, we employed Experimental Vignette Methodology (EVM), a research design involving the presentation of participants with realistic scenarios, followed by the collection of their behavioral preferences. We recruited 400 participants, each compensated with $1.30 for their participation in a 15-minute survey. Within the survey, participants were randomly assigned to one of two conditions: "masculine violation" or "masculine confirmation." In the masculine violation vignette, participants encountered a scenario where an employee's behavior defied traditional masculine norms (e.g., possessing a calm and empathetic demeanor). In the masculine confirmation vignette, participants were presented with a scenario in which an employee adhered to and reinforced conventional masculine expectations (e.g., possessing a confident and bold demeanor). Subsequently, participants were asked to respond to several questions regarding their perceptions of the individuals presented in the vignettes (e.g., "To what extent do you think this person receives respect?") and to report their emotional experiences during the survey (e.g., "How much anger did you experience while reading the story?"). Through this research, we sought to replicate the observation of men regulating the behaviors of other men within an organizational context and to gain a deeper understanding of the motivations behind their participation in such behavior regulation among their peers.

Cy Dupuis, Genevieve Lamson, Kiara Martin & Anna Romero

Mentor: Dr. Lin

University of Louisiana at Lafayette

Does Parental Mental Health Affect Children?

Introduction: While there are many potential origins for Adverse Childhood Experiences (ACEs), one potential risk factor could be parental mental health. According to the findings provided by the 2022 National Survey of Childrens Health (NSCH) by the United States Census Bureau, 16.2% of children have dealt with two or more ACEs.

Methods: We conducted a secondary analysis of this data set to further address the question: Do children (aged 12-17, M = 8.15, SD= 1.48) with parents facing more mental health issues experience more adversity than children who have parents with fewer mental health issues? We hypothesized that as the mental health issues of the parents worsened, the more ACEs the child would encounter. To test our hypothesis, we used the data from 50,892 parents and examined the correlations between paternal mental health, maternal mental health, and ACEs in children.

Results: In line with our hypothesis, paternal mental health, maternal mental health, and ACEs in children were all mutually significantly correlated. The findings suggest that as parental mental health worsened, the number of ACEs increased.

Conclusion: This finding is important because targeting parental mental health could potentially lessen the number of ACEs caused by children in families whose parents suffer from poor mental well-being. Recognizing the positive correlation between parental mental health and number of ACEs may be critical in the context of adverse family dynamic intervention.

Hannelore Jameson, Olivia Hawkins, Daniel Akin, James Albert

Mentor: Daniel Akins

University of Louisiana at Lafayette

Catfish and the Electric Feel: Electroreceptors in the Cetopsidae

Catfishes (order Siluriformes) possess ampullary electroreceptors that can sense the electric signals produced by muscle contractions, however, they lack the tuberous electroreceptors possessed by weakly electric fishes. There are currently two identified orders of weakly electric fishes, the Gymnotiformes of South America, and the Mormyriformes of Africa. These fishes produce high frequency electric signals for prey-location, orientation, and communication. These behaviors depend on the presence of tuberous electroreceptors to receive generated signals. A 1988 article by Andre et. al concludes that a single neotropical whale catfish (family Cetopsidae) Pseudocetopsis spec. (Cetopsis candiru det. John Lundberg) possesses both ampullary and tuberous electroreceptors. Because catfishes are not electrogenic, the function and evolutionary history of this silurid tuberous organ is unknown. In this study, we examine other members of the Cetopsidae to determine if these silurid tuberous organs are widespread within the whale catfishes or restricted to only a few species with unusual feeding strategies. We employed standard histology techniques – paraffin embedding, sectioning, and staining with Hematoxylin and Eosin as well as cresyl violet – on the 5 genera within the Cetopsidae, noting the presence or absence of tuberous receptors and describing the morphology of their electroreceptors. We supplemented our histological data with Scanning Electron Microscopy of the surface of the skin from one specimen of C. coecutiens.

Lisa DiMaggio, Hayley Howard, Destiny Marvel, and Mary Miller

Mentor: Dr. Mary Miller

Baton Rouge Community College, STEM Division

Can Sediment Analysis be used to Further Describe Species Richness in Freshwater Sponges?

The Louisiana Freshwater Sponge Project (LFSP) is a longitudinal study focused on describing the diversity of freshwater sponge species in Louisiana water systems. Sponges are collected and identified using sponge body and/or gemmules spicules and sequencing the COX-1. From collection sites, sediment samples are obtained and analyzed for spicule identification. The sediment analysis process has provided evidence of a more diverse species of sponges than previous LFSP identification methods. As we analyze the samples, the results confirm the observed and collected sponge samples. Sediment analysis has also added different sponge species at those sites, expanding on the species richness for some locations. Analyzing sediment allows us to confirm the presence of species at a particular site without having to collect sponge samples. This process provides a more expansive picture of the species richness at a site regardless of the seasonal parameters at the time of collection.

Jace Segura, Simon Innes, Dr. Nicholas Kooyers

Mentor: Dr. Nicholas Kooyers

University of Louisiana at Lafayette

Productivity Declines: How Plant Productivity Has Varied with Climate Change

Climate change affects populations as they are forced to migrate, acclimate, or adapt to new conditions. Climate change also produces more frequent extreme weather patterns. If populations are unable to migrate, they may undergo shifts in phenology or face novel selection pressures. *Mimulus guttatus* is a highly variable flowering plant that lives as both an annual and perennial along the entire western coast of North America with an elevation range of sea level to 4000m. Climate change and odd weather patterns including a heat dome in the 2021 growing season have affected the timing of the growing season which has therefore affected population phenology and fitness across the entire range of *M. guttatus*. We predict that populations from more recent years will be less fit because of the changing climates. For this experiment, researchers collected phenology data as well as seed and flower samples at 9 sites of varying elevation in the Willamette Forrest in the cascade region of Oregon from 2019 to 2023. Comparing length of growing seasons and productivity from various years shows that plants from later growing seasons were less productive. Past research has shown that plants from historically warmer southern climates are performing better in more northern areas than the native plants. This research demonstrates that climate change may be causing populations to become less adapted to their native environments.

Febee R. Louka, Sommer Osman, Jack H. Smith

Mentor: Dr. Febee Louka

University of Louisiana at Lafayette

Assessing Ecofriendly Louisiana Waste Products in Removal of Pyrene and Chrysene as Models of Oil Spills

Though oil spills have always been present in ocean waters, the amount has greatly increased with global scale oil production. With no two oil spills alike, cleanup provides a difficult and unique challenge to the community. The toxicity of oil spills is related to the presence of Polycyclic Aromatic Hydrocarbons (PAHs). Although the long-term effects on marine life exposed to oil have not been accurately measured, the short term effects are disastrous with mass deaths of animals and plants alike. Current methods of cleanup involve dispersants with research indicating its toxicity may be doing more harm than good. With this problem in mind, green adsorbents are a new low-cost alternative and eco-friendly in regards to the environment. Previous studies have shown their potential in areas such as heavy metal contamination and wastewater treatments. This current study use sugarcane (Saccharumofficinarum) bagasse and, crawfish (Procambarus clarkia) shells Louisiana's major waste products, as potential adsorbents of PAHs. Liquid-Liquid Extractions (LLE) were performed on water samples dosed with pyrene (as individual PAH). Adsorbents were tested under various conditions to determine the optimal settings. These conditions included varying amounts of adsorbents added, varying contact time between water and adsorbent and internal water temperatures. These samples were analyzed using GC-FID and compared to control concentrations. We observed that both adsorbents were able to absorb large amounts of pyrene. Sugarcane bagasse had a much larger efficiency when compared to crawfish in shorter adsorption time and less amount of adsorbent needed. These adsorbents were able to decrease PAH levels to trace amounts in many cases. This study shows the huge potential for using waste products as green adsorbents in oil spills.

Francois Van Staden, Josiah Henry, Jeremiah Green, Kevin Nguyen

Mentor: Arun Lakhotia

University of Louisiana at Lafayette

Collab-ly

If you're an individual with a passion for projects and need help, consider Collab-ly. It's a free web-based platform with premium services that allows like-minded people to join forces and create together. Collab-ly is an exceptional platform that stands out from others like Fiverr, Reddit, or Upwork. It offers direct access to skilled and enthusiastic individuals who are willing to contribute to your projects without any financial commitment. This feature helps you build your network and establish valuable connections and partnerships. Collaborating has never been easier with Collab-ly at your fingertips. It is an online collaboration website that allows users to connect with like-minded individuals when in need of help with a specific task, project, or advice. Frequently, users are forced to look everywhere to find a solution to what they are looking for. Since there is no "one" website where users can find what they need, it can be difficult to pinpoint where to find a solution. Collab-ly also offers the ability for users to become certified. When a certified user uses the platform, they can answer questions related to their field. In turn, users can expect expert solutions for help with any task. In addition, it is free for all users and offers certified users the ability to market more in-depth services. For example, a certified user can market more in-depth user support for their field. Certified users will be recommended to offer surface-level support free of charge to attract people to their other offers. Not only will this provide certified users with the ability to make a return on support, but it will offer users seeking help more specialized support. Collab-ly offers a diverse field of skills for anyone seeking support with their project. For starters, Collab-ly is a supportive community of collaborators waiting to help someone with a similar passion. Furthermore, users can expect practical, accessible, and cost-efficient support from the community itself.

Jacob Stagray, Alexandra Chisterdov, Thomas Stevens, Abbi Faul, Presley Walls, Jessica Fiser, Jordan Richard, Karen M. Smith

Mentor: Jacob Stagray and Dr. Karen Smith

University of Louisiana at Lafayette

Loss of Fgfr1 signaling in the central nervous system results in impaired maternal behavior

Mouse model systems have previously been shown to be a reliable model system for demonstrating behavioral and cellular influences governing maternal rearing and the development of proper endocrine system-based function. A few of these endocrine-based functions pertain to emotional and cognitive responses to stress based on environmental stimuli. Poor maternal care can result in offspring being more susceptible to various health conditions such as anxiety, depression, high blood pressure, and an increased pre-disposition to diabetes. Poor maternal behavior toward pups contributes to more anxious adults, causing worse parenting later in life. Offspring raised by a "neglectful" mother have previously been shown to display a disruption to the typical expression of Glucocorticoid Receptor (GR); as well as other stress hormone associated signaling pathway components. As a result, offspring raised by "neglectful" mothers typically exhibit increased stress/anxiety-associated tendencies.

Fibroblast Growth Factor Receptor 1 (FGFR1) is a cell receptor expressed in neural stem cells (cells of the brain) and glial cells (support cells) within the adult central nervous system (CNS). FGFR signaling has previously been shown to be important for stem cell division/maintenance, neurogenesis, as well as being involved in glial cell-neuron interactions. Within a particular brain region of interest (third ventricle (3V)), our cell type of interest, known as tanycytes are distributed. Tanycytes are a specialized support cell of the brain that have a spectrum of abilities. A tanycyte is a glial cell that has stem cell properties. This means it is an "immature" cell that can develop into other cell types based upon the environmental stimuli and the cell functions needed to respond appropriately. Tanycytes aid in the relation of hormonal signals from the hypothalamus to various structures that regulate bodily functions. Our lab's previous studies have shown that mice with a conditional knockout of Fgfr1 have altered tanycyte morphology and proliferation-abilities.

Our previous experience with the Nestin-Cre (NesCre) mouse line had suggested that female mice lacking the *Fgfr1 gene* (NesCre (+)) in the nervous system exhibited worse maternal behavior compared to females with intact Fgfr1 signaling (NesCre (-)). In our current round of

experiments, we are examining the effects of *Fgfr1 gene* inactivation within the CNS of 1st litter mothers. We then intend to characterize the effects that alterations to this signaling pathway, as well as maternal behavioral traits effects have on their offspring's behaviors and brain physiology. Our preliminary data has shown that NesCre (-) mothers are more adaptability to stressful situations; where as NesCre (+) mothers tended to fail at increased rates when evaluating Pup Retrieval Tests, Nesting behaviors, and overall displaying decreased pup survival rates to adulthood. Progeny from both NesCre (+) and NesCre (-) mothers were aged to reproductive ages and assessed by behavioral tests such as the elevation + maze test, tail suspension test, and fur quality scoring.

Next, we intend to further characterize the surrounding brain regions distributed around the 3V in both maternal and offspring brain regions. These brain regions are essential for properly maintaining typical endocrine hormone-based functions. In particular, we desire to evaluate endocrine pathways that may be impaired due to the inactivation of fgfr1; particularly Prolactin and Oxytocin. These hormones have previously been shown to be important to successful maternal rearing behaviors. Oxytocin and Prolactin are linked to contributing to stimulation of lactation.

John Landry, Wyatt Stoute, Cody Bergeron, Ethan Leblanc, Dr. Magdy Bayoumi, Nick Pugh

Mentor: Dr. Magdy Bayoumi

University of Louisiana at Lafayette

Optimized Design & Analysis of a 3D Printable Picosatellite Structure

Design of an in-house producible picosatellite structure can streamline the turnover rate of satellite development and research. Previously developed structure frames for the Cajun Advanced Picosatellite Experiment were developed with emphasis on the mission at hand rather than future convenience. By utilizing Topology Optimization, Finite Element Analysis, and Vibration Analysis, a generalized modular panel and rail design for 1U, 3U, and 6U picosatellite form factors can be analyzed and developed as in this study. The present study utilizes current NASA structure requirements for safe satellite launch, meets team requirements for electrical component volume, can be manufactured in-house, and can be generalized into future 3U and 6U use or reduced in size for 1U use. Topology Optimization allowed removal of unnecessary mass of individual parts after definition of primary loads experienced during launch. Finite Element Analysis verified structural integrity of the entire assembly. Vibration Analysis of the full assembly by itself and with electrical components displayed weaknesses when experiencing predefined vibration frequencies expected during launch.

Dan Lee, John Michael Weaver, Ipek Kaya, Clinton Akalazu, Raymond Iloegbunam

Mentor: Dr. Hsu

University of Louisiana at Lafayette

Flexi Track

Flexi Tack is an app used by Physical Therapists to assign out-of-appointment workouts for their clients. It uses a point based system similar to a calorie tracker to incentivize the client to complete the workouts. The point system also serves as a way for clients and PTs alike to track progress.

Jonas Schmidt

Mentor: Sercan Aygün, PhD

University of Louisiana at Lafayette

Emerging Computing for Underwater Image Processing

This LaSSO-funded research project explores the synergy of Stochastic Computing (SC) and Hyperdimensional Computing (HDC) to enhance underwater image processing and classification. Leveraging stochastic computing, we address the challenges of haze and noise in underwater images, striving for clarity and precision. Novel bitstream generation techniques are investigated, such as quasi- and semi-random generation, aiming to optimize image quality for improved downstream processing. The next phase involves HDC classification to discern healthy and unhealthy underwater environments. Preliminary results from the SC phase, ongoing HDC exploration, and insights into novel bitstream generation techniques will be presented. This research contributes to the advancement of computing technologies for underwater applications, holding implications for environmental monitoring and beyond.

Karlie Dufrene, Serenity Broussard, William E. Holmes, Daniel Gang, Rafael Hernandez, Mark E. Zappi

Mentor: William Holmes

University of Louisiana at Lafayette

Investigating Chemical Oxidation for Remediation of Emerging Groundwater Contaminant 1,4-Dioxane

1,4-Dioxane is synthetic heterocyclic organic compound that is completely miscible in water. It is classified as a potential human carcinogen and has been associated with cancer, primarily when exposure is prolonged or at high concentrations. 1,4-Dioxane is difficult to remove from the water with conventional distillation and air stripping because it has a similar boiling point to water and a relatively low vapor pressure. Advanced oxidation methods (AOPs) have proven to be capable of oxidizing a wide variety of persistent organic pollutants from water sources, including 1,4-dioxane. Fenton's Reagent is a type of dark AOP that combines hydrogen peroxide with a ferrous salt to produce hydroxyl radicals. This method of oxidation was used in batch addition experiments to test its effects on degrading 1,4-dioxane by varying the concentrations of hydrogen peroxide and ferrous sulfate heptahydrate (the chosen iron salt). This specific AOP has a very quick reaction time, and the experiments were found to be complete after five minutes. The unit of measurement used to quantify effectiveness was the percent removal of 1,4-dioxane after five minutes. Samples were taken at 0, 0.5, 1, 3, and 5 minutes and bovine catalase was used to quench the reaction. All experimental samples were analyzed for 1,4-dioxane concentration using solid phase microextraction (SPME) coupled to a gas chromatograph/mass spectrometer (GC/MS). In terms of results, it was discovered that low ratios of hydrogen peroxide to 1,4-dioxane were not enough to completely remove it. Higher levels of hydrogen peroxide removed the 1,4-dioxane to below detection limits, but there were high levels of hydrogen peroxide left in the reactor after five minutes. The optimum hydrogen peroxide: ferrous ion: 1,4-dioxane ratio that was determined for batch addition Fenton experiments was somewhere between 250:250:250 and 500:500:250.

Karly Daigle, Victor Smith, Ariana Milner, Katelynn Benge, Haleigh Courville, Erika Caramillo-Hatch

Mentor: Erika Caramillo-Hatch

University of Louisiana at Lafayette

Scopolamine has a dose dependent effect on memory in the zebrafish

Alzheimer's disease (AD) is a progressive neurodegenerative disease that targets the entorhinal cortex and hippocampus, primarily impacting memory (Raji et al., 2009). AD also manifests itself in the form of behavioral and psychological impairments (DeTure & Dickson, 2019; Joe & Ringman, 2019). Comparative animal models have been used prominently to study this disease (Drummond & Wisniewski, 2016). Currently, the main organisms used to study AD are transgenic mice. This is because they have amyloid plaques, a prominent physiological formation that typically accompanies AD in humans (Drummond & Wisniewski, 2016). Less research exists focusing on the study of AD in other vertebrates, such as the zebrafish (Danio rerio; Drummond & Wisniewski, 2016; Santoriello & Zon, 2012). Zebrafish share significant genetic similarities with humans, as functional homologs of 70% of diseases found in humans, including AD, are also found in zebrafish (Santoriello & Zon, 2012). Although zebrafish do not develop AD naturally, researchers can elicit AD-like symptoms in zebrafish through use of memory-impairing chemicals, most commonly scopolamine (Zanandrea et al., 2018). Scopolamine is an acetylcholine muscarinic receptor antagonist that is shown to induce AD-like symptoms in zebrafish, such as memory and learning impairments (Zanandrea et al., 2018). Studies observing these effects have utilized inconsistent doses, ranging from 100 to 800 micromolars (Mµ; Boiangui et al., 2021; Santos et al., 2021). Understanding the effects of a range of scopolamine doses is necessary in preventing adverse effects on zebrafish and ensuring consistent outcomes. The current investigation aimed to identify the most effective dosage of scopolamine for eliciting AD-like symptoms in zebrafish. Four groups of zebrafish were given differing doses of scopolamine (50, 100, 200, and 400 Mµ), while one group acted as the control group. Zebrafish were then tested in the Object Recognition Task (ORT) wherein they were presented with familiar or novel LEGO bricks. Object recognition memory was measured by the amount of time in which they swam around the novel LEGO. Distance and velocity were also considered, as they served as indicators of memory in the fish. A repeated measures one-way analysis of variance showed significant effect across groups, $F(4,54) = 6.08$ $p < .05$. According

to a Tukey's test, the 100 (M = 24.32, SD = 18.61), 200 (M = 31.02, SD = 15.85), and 400 Mμ (M = 23.99, SD = 18.65) groups produced significantly more symptoms than the control (p < .05), whereas the 50 Mμ group (M = 36.40, SD = 18.02) was not significantly different from the control (p > .05).

Katie A. Roy, Caroline P. Ybos, Noah L. Hall, Dr. Amy L. Brown

Mentor: Dr. Amy Brown

University of Louisiana at Lafayette

Alcohol Bystander Study

Introduction

Bystander training can provide individuals with the skills and knowledge to step in to intervene in potential acts of sexual violence (Allen et al., 2010), a context that often includes the presence of bystanders (Banyard et al., 2009; Hoxmeier et al., 2018). Additionally, alcohol is often present during instances of sexual assault (Abbey, 2002, 2011). Evidence for the role that alcohol plays in bystander intervention is mixed: Some research has shown alcohol intoxication to impair bystander intervention behavior (among men with pre-existing pro-social bystander attitudes; Leone & Parrott, 2019), but other have shown no effect of intoxication on perceived responsibility for intervening; (Jozkowski et al., 2021).

Methods

University students were sampled at various tailgating events for their reactions to two stories describing a potential sexual assault, one taking place during a party and the other at a bar. The stories were randomly assigned to participants. Their reactions to the scenario, include questions about concern, confidence, social cost, others' responsibility, and willingness to intervene. were then assessed. After reactions, intentions, and demographic information were collected, BrAC levels were gathered using a handheld breathalyzer gun. All participants were compensated with a five-dollar gift card of their choosing.

Results

Mean BrAC was .054 (SD = .067). BrAC was unrelated to any of the dependent variables.

Discussion

The results were found to not be significant, which was consistent with previous findings (Jozkowski et al., 2021), but the true effect of alcohol on bystander intervention remains unclear. The limitations of this study included small sample sizes as our total number of participants was divided between the two different scenarios given. The items in the questionnaire with the highest means were assessing confidence in intervening and willingness to intervene. Perceptions of social costs tended to be low.

Kirsi S. Michael and Cody J. Smith

Mentor: Dr. Brooke O. Breaux

University of Louisiana at Lafayette

Who Done It: William or Winston? The Hidden Biases Revealed by Name Popularity and Socioeconomic Status

Evidence suggests that people with unpopular first names (versus popular names) are more likely to commit crimes (Kalist & Lee, 2009); there is also evidence to suggest that people who have a lower SES (versus higher SES) are more likely to commit crimes (Heimer, 1997). Correlational evidence does not allow researchers to determine whether having an unpopular first name or a lower socioeconomic status (SES) are factors that cause a person to engage in criminality. However, we can explore if these factors influenced students' perceptions of criminality.

We used a fully within-subjects experiment and presented participants with stories about a crime in which we manipulated two variables: the popularity of the primary suspect's first name (popular or unpopular) and the extent to which details about the primary suspect suggest a particular SES (low or high). We used a convenience sample consisting primarily of our department's undergraduate students and have currently obtained a partial data set of 97 participants.

Using a 2 within-subjects (Name Popularity: popular, unpopular) x 2 within-subjects (SES: high, low) repeated-measures MANOVA, we determined that there were no main effects for name popularity or SES. However, there was a significant cross-over interaction effect ($F(1,96)= 6.98$, $p<0.010$).

This interaction effect means that when a suspect was described as having low SES, having an unpopular name resulted in higher ratings of criminality; however, when a suspect was described as having high SES, having a popular name resulted in lower ratings of criminality. If these variables alter perceived criminality in predictable ways once a full sample is obtained, then providing jurors with this type of information during criminal trials could invite application of the fundamental attribution error, resulting in an increase in wrongful convictions and undermining the concept of "innocent until proven guilty."

Lauren Hanna, Yacoub Qamar, and James Cho

Mentor: Dr. James Cho

Southeastern Louisiana University

Green Biochemical Synthesis of Nanomaterials with Hydrophilic proteins/polypeptides-rich aqueous extract of Lubber Grasshoppers, Romalea microptera

This research plan revolves around the extraction, refinement, and the chemical/genetic harnessing of specific advantageous proteins discovered within insects. In the natural world, organisms frequently offer adaptable means to manipulate the structure of organic and inorganic materials at the nanometer scale. While there has been extensive investigation into plants, bacteria, viruses, and marine organisms, insects have received relatively limited attention. Insects also stand as an excellent reservoir of proteins due to their diverse genetic makeup, which includes highly preserved genes responsible for producing functional proteins. These insect-derived proteins can be imbued with additional desired capabilities through chemical or physical adjustments. Some proteins can act as exceptional biotemplates and tools, thanks to their robust interaction with metal ions, enabling the creation of versatile nanomaterials. Nanomaterials based on proteins hold the potential to serve as exceptional resources for tackling antibacterial, antiviral, and potentially even cancer treatments, drug delivery systems, and applications in electronics.

Ke-Sean Peter, Lea Hebert, Layla Johnson, Jovana Latinovic, and Haeyeon Yang

Mentor: Haeyeon Yang

Grambling State University

Laser melting of SmCo5 mixed with nanoparticles

Nanoparticles (NPs) have been known to enhance the thermal transport between molecules such as those in liquids mixed with nanoparticles, so called nanoliquids. Recently, nanoliquids have become available commercially. In this talk, we discuss the approaches of how nanoparticles can enhance the laser melting of lunar regolith and some preliminary data obtained from the laser melting of SmCo5 mixed with titanium nanoparticles at the Grambling State University (GSU). The model is that the powder material becomes liquid while NPs are solid when the NPs of high melting points are mixed with a matrix material of low melting point. We will briefly discuss the planned approaches of laser melting powders mixed with nanoparticles. This project is funded by NASA LaSPACE, NASA Marshall Space Flight Center, NSF PREM program and NSF-LAMDA seed grants.

Sharissa Morrison, Linh Tran, Leah Melancon, Ainsley Graveson, & Hung-Chu Lin

Mentor: Hung-Chu Lin

University of Louisiana at Lafayette

Associations Between Low Birth Weight and Attention-Deficit/Hyperactivity Disorder

This study aimed to understand how low birth weight (LBW) affects the prevalence and severity of attention-deficit/hyperactivity disorder (ADHD). The expected results are that children born with LBW are more likely to have a diagnosis of ADD/ADHD later in life and/or more severe symptoms of ADD/ADHD when compared to children with normal birth weight. We performed a secondary analysis of data obtained by the National Survey of Children's Health (NSCH). Variables of interest were extracted from this data file which includes low or very low birth weight and prevalence and severity of ADHD. The NSCH collected data by identifying households with children, where one child was randomly selected to be the topic of a more detailed questionairre that was completed by a parent. A total of 300,000 parents completed the survey. One-way analysis of variance (ANOVA) and post hoc Tukey tests were performed to compare the effect of birth weight on the prevalence and severity of ADD/ADHD. The results showed that there were statistically significant differences in both the prevalence and severity of ADHD/ADD between children born with very low birth weight (<1500g), low birth weight (1500 – <2500g) and normal birth weight. Specifically, all three groups of birth weight display statistically significant differences from each other in prevalence and severity of ADHD. This effect is of importance because parents who are aware of this association are able to seek early intervention for their children which can result in more positive outcomes.

Lily M. Guidry, Aylin Yigiter, Barbara Marchetti, and Tolga N. V. Karsili

Mentor: Dr. Tolga Karsili

University of Louisiana at Lafayette

Condensed Phase Dynamics of Atmospherically Relevant Molecules at the Air-Water Interface of Organic Aerosols

Volatile organic compounds (VOCs) are emitted into earth's atmosphere through a variety of sources and have consequences for climate and public health. VOC removal consists primarily of reactions with ozone and hydroxyl radicals. When volatile alkenes are oxidized by O_3, the formation of carbonyl-containing products and carbonyl oxides, known as Criegee intermediates (CIs), results. CIs have been the subject of several studies due to their implications in enhancing the oxidizing capacity of the troposphere and in atmospheric aerosol particle formation.

In this presentation, we highlight recent work on the thermal and photoinduced chemistry of CIs at the air-water interface. While the reactivity of small CIs, such as CH_2OO, is enhanced (cf. gas phase), larger CIs are found to be weakly reactive at the air-water interface and bulk solution. Furthermore, oscillator strength to the $1 n\pi^*$ state is significantly enhanced in the condensed phase (cf. gas phase), as studies have revealed that electronic absorption to the $1 n\pi^*$ state is within the region of high solar actinic flux at tropospherically relevant altitudes. All-atom ab initio molecular dynamic simulations of CH_2OO on/in a sphere of many hundred water molecules depict that excitation to the $1 n\pi^*$ state results in the formation of organic acids on a timescale of a few picoseconds, which is enhanced at a lower pH. We have found that the presence of these organic acids at the surface of water droplets significantly lowers their surface tension, which may promote ice nucleation. These simulations have also revealed that methacrolein oxide, a larger CI formed from isoprene ozonolysis, is inert at the air-water interface, allowing for possible absorption of solar radiation and subsequent electronic excitation, which results in either the production of dioxirane products or formation of hydroxyl radicals.

Additionally, we analyze the bimolecular chemistry of CH_2OO with water dimer at the aqueous aerosol surface. The resulting organic hydroperoxide product formed from this reaction may undergo insertion reaction with CH_2OO to form larger oligomeric hydroperoxides, which are more susceptible to deposition into the particle phase. As such, we investigate the

oligomerization of hydroperoxides through CH_2OO addition in the gas phase and at the air-liquid interface and analyze the competition of this oligomerization with the predominant reaction of $(H_2O)_2 + CH_2OO$ occurring simultaneously at the aqueous surface.

Lindsey Kate Storey, Dr. Hrishikesh Desai, Dr. Bill Hu

Mentor: Dr. Hrishikesh Desai

Arkansas State Univeristy

Making Sense of the Black Box of Drug Pricing: Application of Benford's Law

We study whether drugs with certain characteristics are strategically priced and whether certain companies strategically price drugs. We use Benford's (1938) Law to shine light on the black box of drug (medicine) pricing in the pharmaceuticals industry. Benford's Law is a counter-intuitive phenomenon that investigates the frequency of distribution of digits in large datasets and finds that the occurrence of numbers with smaller initial digits is more favored than those with larger digits. For example, the law suggests that the digit 1 in a large dataset would occur roughly 30% of the time while digit 9 would occur roughly only 5% of the time. Non-conformity to Benford's Law, which has previously been applied in healthcare in transfusion medicine and on COVID-19 data, is associated with some form of strategic manipulation. Our initial results suggest that this law is violated by expensive drugs, but we find that cheaper drug prices conform to this law. This provides scientific evidence that the pricing of expensive drugs is more strategic, resulting in the anomalous behavior observation. We are also doing more cross-sectional analysis to understand whether this law is violated based on whether: (a) a company has been accused of drug price rigging in the media, (b) a company is foreign or domestic, and (c) a drug comes under negotiations by the 'Big 4' federal agencies. We believe our results would help regulators focus on areas where the efficiency of drug pricing could be improved and have 'real effects' on drug prices for consumers.

Dr. Justin Fontenot, Dr. Hung-Chu Lin, Dr. Michael Heber, Dr. Arun Kulshreshth, Roberto Enrique E Salazar Rodriguez, Taeus Wright, Kinsey Hatfield, Aidan Guidry, Brielle Jones, Cantika Nasution, Emma Tooraen, Jarvis Landry, Hunter Terro, and Linh Tran
Mentor: Dr. Justin Fontenot, Dr. Hung-Chu Lin, Dr. Michael Heber, Dr. Arun Kulshreshth
University of Louisiana at Lafayette

Examining the Perceptions Among Undergraduate Nursing Students Using Virtual Reality in a Community Course: A Mixed-Methods Explanatory Study

Introduction: This study investigates undergraduate nursing students' perceptions regarding integrating virtual reality (VR) technology into a community nursing course, specifically focusing on home and environmental patient safety assessments. VR technology has shown promise in enhancing community nursing education, offering immersive and realistic learning experiences. This mixed-methods explanatory study aims to understand the student's perception of VR as a learning tool.

Methods: Participants were recruited from a community health course. The students engaged in a VR simulation involving home visits using the vizHome platform. Quantitative and qualitative data were gathered using the Technology Acceptance Model (TAM) and the System Usability Scale (SUS). Interviews captured qualitative insights. Data were collected through Qualtrics for the surveys and secure Zoom connections for the interviews. The analysis involved descriptive statistics, hierarchical regression for quantitative data, and qualitative coding with MAXQDA.

Results: The results indicate that participants perceived VR as valuable and easy to use for learning home assessment skills. Perceived usefulness and ease of use significantly predicted the students' intent to use VR. System Usability Scale (SUS) score revealed room for improvement. Technical limitations were identified as challenges that must be addressed to enhance the user experience.

Discussion: Participants acknowledged VR's potential to supplement traditional learning methods, providing safe and realistic exposure to diverse home environments. While VR was seen as beneficial, it was not considered a replacement for actual home visits in community nursing education. The study emphasizes the need for ongoing research and development.

Luc Allain and James Cho

Mentor: Dr. James Cho

Southeastern Louisiana University

Green Biochemical Synthesis of Biohydrogel with Hydrophilic proteins/polypeptides-rich aqueous extract of American Cockroach, Periplaneta Americana

In recent years, the utilization of biohydrogels as versatile biomaterials has gained significant attention due to their biocompatibility, biodegradability, and tunable physical properties. This research aims to explore the development of biohydrogels using insect proteins as a sustainable and innovative source of biomaterials. Insects, which represent a vast and underutilized biomass, offer a promising alternative to traditional protein sources. This study describes a comprehensive investigation into the extraction and purification of proteins from various insect species, followed by the formulation of insect protein-based hydrogels using various crosslinking techniques, such as green chemical crosslinking and physical crosslinking. The characterization of these hydrogels can encompass mechanical properties, swelling behavior, degradation kinetics, and their potential for controlled release applications. Furthermore, this research delves into the potential biomedical applications of insect protein-derived biohydrogels, including tissue engineering, drug delivery, and wound healing. The biocompatibility and immunogenicity of these hydrogels are thoroughly assessed, with a focus on understanding their interaction with host cells and tissues. By capitalizing on the sustainability and abundance of insect-derived proteins, this study contributes to the development of environmentally friendly and economically viable biohydrogels via green biochemical methods. The findings presented in this research offer valuable insights into the future of biomaterial development, showcasing the potential of insect proteins as a promising avenue for biohydrogel construction with a wide range of applications in the biomedical field.

Lucas M. Futey, Claire Boudreaux, Guillaume de Lombaerde, Timothy A. Clay

Mentor: Dr. Timothy Clay

Nicholls State University

A Survey of the Change in Herpetofauna Biodiversity at the Nicholls Farm in Response to Shifts in the Local Ecosystem

Herpetofauna communities have historically been very vulnerable to changes in their local environments. Monitoring of community biodiversity can be conducted by using plywood artificial cover objects (ACOs) which provide organisms with safe refuge and provides a consistent form of data collection. The main goal of this study is to estimate how the diversity of the herpetofauna community at the Nicholls Farm as the environment has changed from agriculture. This was accomplished through the routine sampling of a plywood ACO array in two recently established field and wetland environments. We recorded the type and number of each species under an ACO as well as temperature during each sampling event. Between September 2020 through October of 2023 18 species of herpetofauna have been positively identified. Diversity of species found under the boards varied between each survey but there is a strong correlation between an increase in temperature and a decrease in biodiversity. The most abundant species found year-round independent of temperatures under the ACOs is Scincella lateralis. Future work will compare biodiversity between our field and wetland sites as the vegetative communities mature and become established.

Luke Abraham, Grace Parker, Tanner Mergist, Andrew Kieu

Mentor: Arun Lakhotia

University of Louisiana at Lafayette

Leauxcal Spot

Our vision at Leauxcal Spot is to be the trusted bridge between local businesses and their communi9es, promo9ng growth, authen9city, and discovery. We envision a world where locals champion their favorite spots, and travelers effortlessly find hidden gems. We are dedicated to fostering a vibrant local economy, enhancing the livelihoods of local business owners, and ensuring that every place has a story to tell. Unlike our compe9tors, our plaCorm aims to empower individuals to make informed choices and build meaningful connec9ons, fostering a global community that celebrates the essence of every neighborhood. Together, we're crea9ng a world where every review is a stepping stone to discovering the heart and soul of a place, making local businesses shine and travelers feel at home, no maFer where they roam.

Maelle Valarezo

Mentor: Thomas Sammons and Geoff Gjertson

University of Louisiana at Lafayette

Latino Civil Rights Museum

The Latino Civil Rights Museum (LCRM) is a three-storied cultural-based museum. It aims to provide more than enough resources to visitors who want to expand their knowledge through Latino and Hispanic artwork collections. Along with the various collections, the Latino Civil Rights Museum also features numerous activities and exclusive events geared toward Latin education. Through these collections of rich artwork, events, and comprehensive exhibits, the LCRM hopes to tell a thrilling story about the extensive Latin American culture through the personal experiences of those in the community. However, it is not only the artwork that pays homage to Latin culture, but the entire architecture of the museum is rooted in the culture as well. The museum also proudly boasts the various vibrant colors that were used throughout the history of Latin America. These colors take the shape of vertical elements. Upon entering the Latino Civil Rights Museum, you are welcomed by an atrium that runs across the building allowing natural light to filter through and illuminates every level. As you begin to ascend the interior of the building, you are able to see through the colorful vertical elements located on the museum's exterior. The Latino Civil Rights Museum stands proudly as a haven for Latin America's deep history and widespread culture, even housing an onsite memorial for those who have passed in the pursuit of protecting Latin culture. Its objective is to provide everyone with a chance to learn and experience what Latin culture offers with the hope that it enriches all communities.

Mckenna K. Chaney, Samuel E. Velasquez, Elizabeth B. Labarre, Sujoy Ghosh, and Jaycob D. Warfel

Mentor: Jaycob Warfel, PhD

Baton Rouge Community College, Pennington Biomedical Research Center, and Christian Brothers University

Male mice lacking HuR in skeletal muscle show enhanced glucose uptake at a young age

Metabolic Flexibility describes the ability of a system to flex between different metabolic substrates based on their availability. We have found that human and murine skeletal muscle with decreased activity of the regulatory RNA binding protein, HuR, have a decreased capacity for lipid oxidation, and thus decreased metabolic flexibility. At 20 weeks of age, both male and female skeletal muscle HuR knockout mice have increased fat mass relative to controls, but this contributes to decreased glucose clearance relative to controls in male HuR knockout mice only. Intriguingly, when mice are assayed at 10 weeks of age, male skeletal muscle HuR knockout mice show enhanced glucose clearance relative to controls. We hypothesized that the decreased ability to utilize lipids in skeletal muscle of male HuR knockout mice may result in an increased reliance upon glucose in this organ, and thus tested if glucose uptake was higher in skeletal muscle of these mice relative to controls. Male HuR knockout mice show a significant increase in glucose uptake in skeletal muscle relative to controls, while females show no difference. Uptake of lipid is not different in a variety of tissues for both male and female mice. Transcriptomic and mRNA expression results show that male HuR knockout skeletal muscle has increased expression of glycolytic genes and decreased expression of oxidative phosphorylation genes relative to both controls and female HuR knockout mice. Pyruvate oxidation is also decreased, and serum lactate levels are increased for male HuR skeletal muscle knockout mice relative to controls. These results suggest increased reliance upon glycolysis followed by fermentation as compensation for a decreased capacity for mitochondrial respiration in the absence of HuR.

Micah Renfro

Mentor: Thomas Sammons

University of Louisiana at Lafayette

Latin American Civil Rights Museum

Myles Goldman

Mentor: Tommie Nelson

University of Louisiana at Lafayette

A Marketing Analysis for Chennault Aviation and Military Museum

The Chennault Aviation and Military Museum in Monroe, La, displays artifacts from World War I to Operation Iraqi Freedom. It is one of three locations that remain from its original construction as part of Selman Army Airfield (then under an alternative purpose). Once the biggest flight navigator training school in the United States, how could a place with such rich history remain relevant in the 21st century? The museum documents the career of General Chennault from his service in WWI, to his creation of the Flying Tigers. (The museum doesn't exclusively offer military history. A visitor can be introduced to the birthplace of Delta Airlines, and if there is a veteran in need, have a vast support system willing to help them.)

Marketing has been well ingratiated with multiple aspects of educational subjects, social gatherings, and spans multiple genres. The purpose of this project is to analyze the marketing activities of a museum to help determine what more could be done to gain additional Gen Z and Millennial visitors. Rough estimates of the effect of several strategies and events the museum offers have been documented. The recommendations given are suggestive measures that can be potentially taken by the organization to garner more visitor traffic. Studies have shown a positive correlation between the flow of visitors and various methods of online social media presence. Therefore, social media marketing strategies will be an important part of the recommendations for future marketing plans.

Kamal Alsammour, Alexander Castille, Yalda Gheisi, David Nwabuike, Nelson Spooner, II, Cameron Weber

Mentor: Dr. Sonya Hsu

University of Louisiana at Lafayette

Points For Perks

This project involves creating a rewards system for an upcoming local retail business. The group involved in this project were split into two teams: a front-end and back-end team. The front-end team designed and developed the user interface for the varying webpages of the application—homepage, login page, registration page, account page, and transaction page. The back-end team created the databases that will retain the user's information—username, password, email, etc. The two teams meet and discuss how to connect the interfaces with the databases.

Paul Chu, Mamie Tilbury, Colin Lanclos, Devan Smit

Mentor: Dr. Arun Lakhotia

University of Louisiana at Lafayette

Magnolia Muscle Club - Empowering Fitness Enthusiasts Online

Magnolia Muscle Club is an exclusive online fitness platform where individuals passionate about health and strength come together to transform their lives. We've redefined the fitness journey, combining the best aspects of a physical gym with the convenience of a digital community. Here, users can access a range of virtual fitness classes, track their progress, set goals, and connect with like-minded individuals from the comfort of their homes. Magnolia Muscle Club isn't just about building muscles; it's about building a supportive Southern community dedicated to personal fitness growth.

Set and Crush Your Goals: At Magnolia Muscle Club, we believe in the power of setting and achieving fitness goals. Our platform allows users to define their objectives, whether it's shedding pounds, gaining muscle, or enhancing overall wellness. We provide you with the tools to create personalized workout plans aligned with your goals, making every step of your fitness journey deliberate and purposeful.

Expert Instruction with YouTube Videos: To ensure you perform exercises correctly and safely, we offer a library of expertly crafted YouTube videos. These videos demonstrate proper form and technique, making it easier for you to master each movement. Whether you're new to fitness or an experienced athlete, our videos provide invaluable guidance to help you get the most out of your workouts.

Ryan Fontenot, Walter Galdamez, Wu Xu

Mentor: Wu Xu

University of Louisiana at Lafayette

Comparison of Opsins and Rhodopsin Light-Sensitive Visual Proteins

A large part of vision is contributed to the human body by light sensitive proteins, specifically Rhodopsin. Rhodopsin is primarily found in the rod cells of the retina and acts as a photoreceptor molecule, where when exposed to light it will undergo a series of biochemical reactions. This leads to electrical signaling from the eye to the brain, where the electrical signal is eventually processed into an image the eye can "see". The focus of this study is understanding the protein interactions with the surrounding microenvironment of the eye and how similarities in protein sequence and subsequent protein 3D structure are attributed to the eye microenvironment. Moving forward, although we don't yet have a full understanding of the results, we will be conducting further tests to determine the common substructures of individual proteins. We will conduct similarity value tests, and other methods using TSR, to determine how these similarities may predict the 3D structures and substructures of the Opsins and their ligand Retinal.

Samantha Huszar, Bailey Mabou, Torrie Cook, Arthur Penn, and Alexandra Noël

Mentor: Dr. Alexandra Noël

Louisiana State University

Respiratory Effects of Maternal Vaping on Offspring in a Mouse Model

Within youth culture the use of electronic-cigarettes (E-Cig) or vaping is seen as a way in which we create ways to connect with other people, create feelings of relaxation, and it provides distractions from situations that can be stressful. Most importantly, it contains nicotine, an addictive substance. Also, with the ideology that vaping is "safer" than smoking cigarettes, youth often perceive e-cigarettes as not posing a serious health risk. However, this is not the reality. In the first phase of our research, we aimed to determine the effects of vaping during pregnancy on adverse pregnancy outcomes, including stillbirth, birth weight and length, in a mouse model. This phase of our research displayed that in wildtype (WT) mouse offspring, in utero E-Cig exposures negatively affect pregnancy outcomes, including decreased birth length, while the removal of the IL-10 gene seems to improve the impact of vaping on these outcomes. In the next phase of our research, we are aiming to determine how maternal vaping affects the offspring's respiratory health later in life, e.g., during adulthood. Using a house-dust mite (HDM)-induced asthma model, we will evaluate lung function and lung transcriptome changes in adult mouse offspring previously exposed in utero to E-Cig aerosols. Due to the first phase of our research displaying that the removal of the IL-10 gene seems to improve the pregnancy outcomes following in utero exposures to E-Cig aerosols, our main focus is to determine if the removal of the IL-10 gene decreases the asthma-like responses from the HDM allergen. Overall, thus far, this research showed that in utero exposure to E-Cig aerosols can negatively affect pregnancy outcomes, and thus, the use of E-Cig during pregnancy is not "safe".

Sharissa Morrison, Linh Tran, Leah Melancon, Ainsley Graveson

Mentor: Dr. Hung-Chu Lin

University of Louisiana at Lafayette

Associations Between Low Birth Weight and Attention-Deficit/Hyperactivity Disorder

This study aimed to understand how low birth weight (LBW) affects the prevalence and severity of attention-deficit/hyperactivity disorder (ADHD). The expected results are that children born with LBW are more likely to have a diagnosis of ADD/ADHD later in life and/or more severe symptoms of ADD/ADHD when compared to children with normal birth weight. We performed a secondary analysis of data obtained by the National Survey of Children's Health (NSCH). Variables of interest were extracted from this data file which includes low or very low birth weight and prevalence and severity of ADHD. The NSCH collected data by identifying households with children, where one child was randomly selected to be the topic of a more detailed questionairre that was completed by a parent. A total of 300,000 parents completed the survey. One-way analysis of variance (ANOVA) and post hoc Tukey tests were performed to compare the effect of birth weight on the prevalence and severity of ADD/ADHD. The results showed that there were statistically significant differences in both the prevalence and severity of ADHD/ADD between children born with very low birth weight (<1500g), low birth weight (1500 – <2500g) and normal birth weight. Specifically, all three groups of birth weight display statistically significant differences from each other in prevalence and severity of ADHD. This effect is of importance because parents who are aware of this association are able to seek early intervention for their children which can result in more positive outcomes.

Shelby Meche, Jordan Grider, Soundharya Dhanabal, Wu Xu

Mentor: Wu Xu

University of Louisiana at Lafayette

Comparison of the Protein Structures of Mammalian Caspases

This research focuses on comparing the protein structures of mammalian caspases which are proteins that are involved in the process of apoptosis or programmed cell death. There are three main types of mammalian caspases: initiator caspase, executioner caspase, and inflammatory caspase. Initiator caspases initiate the apoptosis signal while executioner caspases carry out the mass proteolysis leading to apoptosis. Inflammatory caspases are involved in inflammatory cytokine signaling and pyroptosis, cell death caused by a microbial infection. We gathered a data set of proteins from the RCSB Protein Data Bank (PCB) and evaluated their structural similarity using the TSR-based method. This method generated a cluster map that was used to compare the proteins based on structural similarity. Other figures were made from this data comparing the structural similarity of each caspase type as well as evaluating the presence of common and unique substructures. A phylogenetic tree based on amino acid sequence rather than structure was also generated using the software Molecular Evolutionary Genetic Analysis (MEGA).

From this data, we gathered that the sequence analysis presents executioner and initiator caspases as more similar, while the structural analysis using the TSR-based method indicates that executioner and inflammatory caspases are more similar. The common and unique substructures identified in the data set provide the structure basis for designing drugs to inhibit all types of caspases and specific types of caspases, respectively.

Fudong Lin, Summer Crawford, Kaleb Guillot, Yihe Zhang, Yan Chen, Xu Yuan, Li Chen, Shelby Williams, Robert Minvielle, Xiangming Xiao, Drew Gholson, Nicolas Ashwell, Tri Setiyono, Brenda Tubana, Lu Peng, Magdy Bayoumi, Nian-Feng Tzeng

Mentor: Dr. Nianfeng Tzeng

University of Louisiana at Lafayette

Crop Yield Prediction

Precise crop yield prediction provides valuable information for agricultural planning and decision-making processes. However, timely predicting crop yields remains challenging as crop growth is sensitive to growing season weather variation and climate change. In this work, we develop a deep learning-based solution, namely Multi-Modal Spatial-Temporal Vision Transformer (MMST-ViT), for predicting crop yields at the county level across the United States, by considering the effects of short-term meteorological variations during the growing season and the long-term climate change on crops. Specifically, our MMST-ViT consists of a Multi-Modal Transformer, a Spatial Transformer, and a Temporal Transformer. The Multi-Modal Transformer leverages both visual remote sensing data and short-term meteorological data for modeling the effect of growing season weather variations on crop growth. The Spatial Transformer learns the high-resolution spatial dependency among counties for accurate agricultural tracking. The Temporal Transformer captures the long-range temporal dependency for learning the impact of long-term climate change on crops. Meanwhile, we also devise a novel multi-modal contrastive learning technique to pre-train our model without extensive human supervision. Hence, our MMST-ViT captures the impacts of both short-term weather variations and long-term climate change on crops by leveraging both satellite images and meteorological data. We have conducted extensive experiments on over 200 counties in the United States, with the experimental results exhibiting that our MMST-ViT outperforms its counterparts under three performance metrics of interest.

Sydney Gemeinhardt, Mary Miller, and Cameron Motsenbocker

Mentor: Mary Miller

Baton Rouge Community College, STEM Division

Defining the preferred substrates of Louisiana Freshwater Sponge Species

Freshwater sponges are understudied, environmental health indicators. These organisms are filter feeds that assist in cleaning freshwater ecosystems. To further understand the driving factors of freshwater sponges, the Louisiana Freshwater Sponge Project has prioritized the identification and tracking the diversity of these organisms. From previous studies, it is known that Freshwater sponge survival is dependent on water quality and availability of substrates. However, little is known of the preferred substrates that contribute to sponge growth and development. This study analyzed substrate specificity of 1106 collected and identified sponge samples for the 15 documented freshwater sponge species in Louisiana. By knowing the preferred substrates, we can predict the likelihood of sponge growth and their ability to aid in environmental health.

Aidan Guidry, Sydney Guidry, Sophie Peschier, Solomon Adegoke

Mentor: Dr. Hung-Chu Lin

University of Louisiana at Lafayette

The Effects of Family Eating Meals Together, Age, and Parental Participation in Activities on Making and Keeping Friends During Childhood

Previous research suggests that child participation in extracurricular activities is associated with lower levels of parental aggravation (La Charite et al., 2023). Studies also suggest that families eating meals together is positively associated with children's social skills (Lora et al., 2014). This study examined the associations between family eating meals together, parental participation in organized activities, and making and maintaining friendships in childhood and adolescence.

Data of 50,892 children aged 0-17 years old (24,424 females, *M age* = 8.2, *SD age* = 5.3) was drawn from the 2021 National Survey of Children's Health Child and Adolescent Health Measurement Initiative reference group. Parents responded to items regarding the amount of difficulty their children had making friends, the number of times per week the family ate meals together, and the frequency that they attended their children's extracurricular activities. Parent's participation in child's activities was positively correlated with the child's ability to make and keep friends ($r = .11$, $p < .001$). Family eating meals together was negatively correlated with child's ability to make and keep friends ($r = -.10$, $p < .001$) and parent's participation in child's activities ($r = -.10$, $p < .001$). The older the child, the less likely the family ate meals together ($r = -.28$, $p < .001$).

The results suggest that parental involvement could model positive social behaviors, like support, leading to an increase in a child's ability to make friends. The negative correlations between eating meals together and age may be due to increased independence during adolescence.

Tabatha Daigle and Deborah Cibelli

Mentor: Deborah Cibelli

Nicholls State University

Propaganda in the Oldest of Places: Augustus in Imperial Rome

In his book, *The Power of Images in the Age of Augustus*, Paul Zanker states that Roman architecture and art mirror society. They reflect society's values and beliefs —especially when made during a period of transition or crisis (Zanker, 1988). Nevertheless, people often overlook some of the meaning of works of art due to the lack of understanding about their impact on society. Nothing in an artwork is more important for a group than its message. In this regard, art and the message go hand in hand. An example of this is shown clearly in art made during the age of Augustus. As a ruler, Augustus knew the value of a work of art to communicate an idea to manipulate and influence a person's beliefs. Today, people are self-conscious of how they look and how others perceive them, especially politicians. Political figures must be meticulous about how the public views their "image." They use all types of images and commercials to convey to the public what they believe in, what they stand for, what they are promoting, and what they wish to accomplish. Studying Roman art shows how closely art, politics, and propaganda are related and can intertwine, especially in the art made for Augustus. He was able to exert his power through the arts to communicate his ideologies. One of his major commissions was the statue of Augustus of Primaporta which is not a traditional portrait. It represents his connection to the past and his role as a victorious emperor. The statue shows his connections to the gods, Apollo and Diana, and his role as a peace-bringer to the Roman empire. His art allows us to examine the use of art as propaganda.

Tarry Glover, Tamieka Palmer, Rose Dawes, Abhi Mehrotra and Mary Miller

Mentor: Dr. Mary Miller

Baton Rouge Community College

The Louisiana Freshwater Sponge Project: Examining Changes in Species Diversity through a Comparison of two Ecological Studies

Began in 2019, the Louisiana Freshwater Sponge Project (LFSP) is a longitudinal study focused on describing the diversity of freshwater sponge species in Louisiana water systems. While very understudied, freshwater sponges have been reported to be environmental health indicators. Tracking any change in species diversity over time may provide a picture of the health of an ecosystem and the impact of those environmental factors on freshwater sponges. The LFSP ecological survey is designed to compare the current freshwater sponge diversity with the documented 1969 freshwater sponge diversity. Thus far, LFSP has resurveyed over 81 of the original sites included in the previous survey. In a select few areas, we have observed an increase in diversity, but overall, we have recorded a decline. The most prevalent species are *Trochospongilla horrida* and *Eunapius fragilis* which is consistent with the previous study. In addition to comparing previous water systems, we have expanded the study to include over 170 new sites and have identified over 1,400 samples.

Veronica Colmenarez, Sarah McCleskey, Savannah Blanco-Trumps

Mentor: Dr. Lauren Auverset van Gerwen

University of Louisiana at Lafayette

Scrolling to Success: Public Universities in Louisiana's TikTok PR Playbook

TikTok has rapidly emerged as a dominant social media platform, especially among Generation Z students, offering universities a unique channel for outreach and engagement. Through a textual analysis of public universities' official TikTok accounts and their utilization of TikTok as a communication tool, this study will examine Organization-Public Relations (OPR) strategies employed by public universities in Louisiana (N = 14) on TikTok and examine how these strategies shape their interactions with Generation Z. This analysis of elements included in TikTok messaging will shed light on themes and communication tactics used by Louisiana public universities to reach their key publics through this new medium. Additionally, the study aims to uncover how universities address critical issues such as inclusivity, community engagement, and crisis management within this digital landscape.

Melanie Rubin, Zachary Roberts, Jaymes Durriseau

Mentor: Jaymes Durriseau

Southern University and A&M College

Cognitive and Social Factors in Decisions to Shoot

This study investigated the relationship between ethnic identity and attentional control in African American participants. The participants completed three tasks: a first-person shooter task, an antisaccade task, and the Multigroup Ethnic Identity Measure (MEIM). The antiscadde task measured attentional control. The MEIM measured ethnic identity. The results showed a racial shooting bias where unarmed black targets were shot more than unarmed white targets. This bias was not associated with attentional control. However, the racial bias was modulated by different levels of ethnic identity. High ethnic identity scores were not associated with racial shooting bias, but lower ethnic identity scores were associated with decreased accuracy for unarmed black targets when compared to unarmed white targets. These findings suggest that ethnic identity may play a role in racially biased shooting decisions.

Kirsi S. Michael and Cody J. Smith

Mentor: Dr. Brooke O. Breaux

University of Louisiana at Lafayette

Who Done It: William or Winston? The Hidden Biases Revealed by Name Popularity and Socioeconomic Status

Evidence suggests that people with unpopular first names (versus popular names) are more likely to commit crimes (Kalist & Lee, 2009); there is also evidence to suggest that people who have a lower SES (versus higher SES) are more likely to commit crimes (Heimer, 1997). Correlational evidence does not allow researchers to determine whether having an unpopular first name or a lower socioeconomic status (SES) are factors that cause a person to engage in criminality. However, we can explore if these factors influenced students' perceptions of criminality.

We used a fully within-subjects experiment and presented participants with stories about a crime in which we manipulated two variables: the popularity of the primary suspect's first name (popular or unpopular) and the extent to which details about the primary suspect suggest a particular SES (low or high). We used a convenience sample consisting primarily of our department's undergraduate students and have currently obtained a partial data set of 97 participants.

Using a 2 within-subjects (Name Popularity: popular, unpopular) x 2 within-subjects (SES: high, low) repeated-measures MANOVA, we determined that there were no main effects for name popularity or SES. However, there was a significant cross-over interaction effect $(F(1,96)= 6.98, p<0.010)$.

This interaction effect means that when a suspect was described as having low SES, having an unpopular name resulted in higher ratings of criminality; however, when a suspect was described as having high SES, having a popular name resulted in lower ratings of criminality. If these variables alter perceived criminality in predictable ways once a full sample is obtained, then providing jurors with this type of information during criminal trials could invite application of the fundamental attribution error, resulting in an increase in wrongful convictions and undermining the concept of "innocent until proven guilty."