

## List of Presentations

### **Phylogenetic Placement of diatom genera using whole mitochondrial genomes**

Author: Rebecca Adams

Major: Biological Sciences

Sponsor: Joshua Cooper

Diatoms are a diverse group of single-cell eukaryotic algae with cell walls made of silica. These algae can occupy a variety of aquatic niches and play significant roles in carbon and oxygen cycling. Previous attempts at understanding the evolutionary history of diatoms have presented conflicting results. In this study, we have focused on the mitochondria of diatoms and have described 14 diatom mitochondrial genomes to explore the utility of these genomes in phylogenetics. The phylogenetic reconstruction based on protein coding regions of the diatom mitochondria resolved similar patterns evidenced by using chloroplast. However, discrepancies still exist between the two, demonstrating the need for further sampling. Our study also investigates the gene organization among these genomes to identify patterns across species and found that closely related species seem to have a conserved gene order.

### **Gender and Barriers to Mental Health Services for People with Autism**

Author: Sarah Adams

Major: Social Work

Sponsor: Megan Lindsey

Individuals with autism spectrum disorder (ASD) have high levels of comorbid mental health disorders compared to other developmental disability populations. Despite high rates of mental health service utilization people with autism report more barriers to receiving quality care and higher service needs than those with other disabilities. This study examines gender differences in reported barriers to autistic persons receiving mental health care. Barriers to healthcare were measured using a modified version of the barriers to healthcare checklist. This study will assist providers in meeting the service needs of autistic clients of marginalized genders and inform client self-advocacy.

### **Statistical Analysis of Knee Structures**

Author: Jacob Adkins

Major: Applied Mathematics and Theoretical Statistics

Sponsor: Joseph Nolan

The primary goal of this study was to see if age affects the usability of various knee structures. Cadavers are used to assess each knee structure's ability to withstand force and ultimately, examine the distribution of contributions across the knee structures. It is also important to assess potential relationships between knee structures and how they contribute to the ability to take force in relationship to one another. In this presentation we illustrate statistical methods used to identify how various knee structures are affected by age, determine if there are relationships between structures and determine if there are relationships between knee structures and their ability to hyperextend.

### **What are the leading factors behind some Forensic Interviewers exiting the profession?**

Author: Tala Al Masri

Major: Social Work

Sponsor: Megan Lindsey

Emotional exhaustion, burnout, and job satisfaction have been studied extensively among child welfare workers and other human services professionals. But there is a dearth of information when it comes to forensic interviewers (FI). It is critical that we identify the reasons why some Forensic interviewers decide to exit the field. The proposed research will try to explore the effect of emotional exhaustion, role ambiguity and external and internal support have on forensic interviewers at an agency in Kentucky, how they have tried to cope, and how that has affected retention.

### **The Impact of Rurality on Shaping the Opioid Crisis in the United States**

Author: Tala Al Masri

Major: Social Work

Sponsor: Suk-hee Kim

The United States has been negatively impacted by the opioid crisis, but rural areas have been especially affected. This study is a systematic review that examines the barriers that people who use drugs (PWUD) face in rural areas such as lack of access to substance abuse treatment options and the excessive rates at which physicians prescribe opioids. It also takes a closer look at the societal dynamics of rural communities and how it may promote opioid misuse. Stigmas surrounding receiving substance abuse treatment in a close-knit rural community and the criminalization of drug users can discourage utilization. Studies show that administering the needed services in rural areas to help with the opioid crisis can be burdensome – physically and financially, adding to the problem. Despite these challenges, studies examining programs targeted at the opioid epidemic in rural areas have found promising results.

### **Harmful Algae Image Classification With Machine Learning**

Author: Abdikani Ali

Major: Mathematics and Statistics

Sponsor: Michael Waters

Harmful algae can grow rapidly into blooms and release toxins that can contaminate drinking water sources which can be unsafe to humans and wildlife. This research has discovered images belonging to seven different genera of harmful algae which were used as a data set to train a convolutional neural network (CNN) to automatically classify harmful algae at the microscopic level. After data augmentation, 20,010 images were trained on the network. Our CNN has shown an overall accuracy of 99.75%. The next steps include collecting more original images and modification the neural network architecture to improve the accuracy of unseen images.

**Underrepresentation of Women in Technology Leadership – Impacts, Causes, Solutions**

Author: Amy Alig

Major: Integrative Studies

Sponsor: Rhonda Davis

Diversity and inclusion in leadership results in better decisions, more innovation, and better financial outcomes. Yet women are disproportionately absent from technology leadership positions. This presentation integrates research of multiple disciplines to bring to light the negative economic and societal impacts of this underrepresentation, and theories regarding the root causes, and studies suggesting possible solutions. Only women are addressed; other marginalized groups, such as people of color and LGBTQ+, are not.

**Challenges Females Face in STEM and the Difficulties Retaining Them**

Author: Kayla Allen

Major: Integrative Studies

Sponsor: Rhonda Davis

There is a complex issue with female recruitment, support, and retention in STEM (Science, Technology, Engineering and Math) related fields. Insights are drawn from the disciplines Psychology, Sociology, and Education; Psychology draws insight on how females feel, Sociology draws insight on the predetermined stereotypes society has set, and Education draws insight from what could be done with the proper education towards dealing with these challenges. Proportional Theory and Imposter Phenomenon are closely related to the Psychological aspects, while Social Role Theory, Retention Theory, and Stereotype Threat Theory is closely related to the Sociological. Actions towards the retention of females in STEM are apart of the right type of education towards knowing the challenges a female meets.

**NKU UROCC – Undergraduate Research in Organic Chemistry Course Synthesis and Purification of Heteroaryl Compounds as Potential Cancer Treatment Molecules**

Author: Olivia Allen

Major: Biological Sciences

Sponsor: Lili Ma

Heteroaryl compounds are useful in the pharmaceutical field and may act as inhibitors for the aromatase enzyme to combat breast cancer. Molecules studied in this project were nitrogenous heterocycles with a tropinone scaffold. The heterocycle and tropinone are synthesized via  $\alpha$ -heteroarylation. Microwave irradiation was completed at 170° for 20 minutes. Water and ethyl acetate were used for extraction. NMR and MPLC were used to determine the purity of the compound. This work is important because we now know the proper conditions to synthesize and purify the I80-H11 heteroaryl compound.

## **Al-shatrat\_2021 System and Metric Analysis Comparison of Neo4j and Microsoft Azure Cosmos DB**

Author: Mohammad Al-shatrat, Jeffery Mills, and Brian Street

Major: Computer Science

Sponsor: Trian Truta

Graph databases provide a powerful solution for designing databases to store and retrieve relationship dense datasets such as in social media and recommendation engines. Two of the leading graph database implementations used in mainstream application development are Microsoft Azure Cosmos DB and Neo4j, each with their own benefits and drawbacks. In this paper, we test and compare the results of both offerings, focusing on key performance metrics like response speed, scalability, and cost, paired with an analysis of unique feature sets to identify which is the better option for application development.

## **Publicity Planning for Promoting Research**

Author: Lilly Appelfeller and My Doan

Major: Business Administration

Sponsor: Joe Cobbs

Intergroup conflict, or rivalry, profoundly affects society. The Know Rivalry Project is a collaborative research effort devoted to continuous and sustainable collection, analysis, and dissemination of rivalry knowledge. Promoting the project and knowledge generated is important to achieving sustainability, and specifically garnering resources for future student involvement. Consequently, we built a multi-stage media strategy to engage reporters across diverse channels in the research findings to bring greater awareness to the scientific advancements at NKU regarding rivalry. That strategy includes crafting storylines and investigating applicable target audiences for relevant publicity.

## **Synthesis of Heteroaryl Molecules Through Palladium-Catalyzed Heteroarylation**

Author: Kira Asch

Major: Biology

Sponsor: Lili Ma

Heteroaryl compounds are commonly used in medicinal chemistry. Most pharmaceuticals are made from heteroaryl compounds. The purpose of this project was to study bioactive heteroaryl compounds that could potentially be a breast cancer treatment due to its likelihood to inhibit aromatase, a pharmaceutical target for breast cancer. Through our research we reacted different heteroaryls with tropinone by microwave assisted, palladium-catalyzed direct  $\alpha$ -heteroarylation. The products were then purified, identified, and evaluated by MPLC, NMR, and computer modeling. This study provided not only useful discoveries in cancer research, but also developments of CURE and UROCC labs for undergraduate chemistry students.

### **Benefits of Quality Childcare**

Author: Gail Bacis

Major: Social Work

Sponsor: Caroline Macke

For low-income families, quality childcare can be expensive and often hard to find. Obtaining access to quality childcare is not only beneficial to the child(ren) but can also improve parent-child outcomes as well. By means of a self-administered, electronic survey, this study intends to support the hypothesis that access to quality childcare can also improve parent-child outcomes for low-income families. These findings will help further advocate for high-quality, affordable child care.

### **Public Opinion on Environmental Regulation**

Author: Noel Baker

Major: Political Science

Sponsor: Shauna Reilly

Environmentalism, as it pertains to governmental action and public opinion, is of growing importance, as concepts of global warming, climate change, sustainability, and beyond are becoming increasingly more relevant. To what extent do political affiliation and age range influence public opinion on environmental regulation? Evidence from various academic journals, as well as results from a recently conducted survey prove that both factors play a role in the extent by which the public wants environmental regulations implemented. Exploring this research and its results allows for further understanding on this pertinent topic, providing evidence on which factors need to be addressed for substantive change to ensue.

### **Long Term Prevention of Elder Abuse in The Nursing Homes**

Author: Raven Barber

Major: Integrative Studies

Sponsor: Steven Watkins

Elder abuse in the nursing homes happens to frequently to residents and little is done to help protect them. According to the National Center on Elder Abuse (NCEA), roughly 95% of nursing home residents have been neglected or have witnessed neglect. Frequent Staff training, proper background checks and surveillance cameras are some factors that could prevent elder abuse in the long term. The purpose of this study is to look at different causes of elder abuse in the nursing home. Research on results of how surveillance cameras help in a result to prevent less abuse will achieve ending elder abuse in the long term.

### **Innocence Lost: How Children's Literature Can Provide an Ethical Education on Factory Farming**

Author: Brookelynn Bargo

Major: Integrative Studies

Sponsor: Steve Watkins

Factory farms are the high-speed mass production and slaughter of animals for the meat and dairy industry. In order to raise awareness of factory farms, also known as industrial farm animal production, parents and educators should utilize children's literature to inform future generations about the individual impact they have on farm animals. Raising awareness in children and teenagers will lead to more advocates for the animals bred, raised, and slaughtered in factory farms while also giving the children the truth about what's on their plates and going in their bodies. Sheltering children from the knowledge of what happens to their food when it is still an animal takes away choices that could lead them to decide what kind of ethical human they want to be. The next generation will inherit the world with the knowledge passed onto them, they should be taught early on the impact they have on the world around them so that they may make informed choices every day. It is society's ethical duty to raise morally conscious children, if children are not told the truth then they will not be given the full extent of their choices. Choices that will impact their health, moral consciousness, and their personal values during key developmental years.

### **Public Opinion on Gun Control**

Author: Joshua Barnes

Major: Political Science

Sponsor: Shauna Reilly

Previous studies have shown that support for gun control is not simply a partisan issue. Studies show that the gridlock in Washington is not representative of how average Americans view this issue. This survey seeks to show that personal experience and demographics shape one's opinion on gun control. A survey of 20 questions was created to poll public opinion on gun control. Five demographic questions were included. This poll was distributed via social media. Results show in many cases partisans may cross over, like the issue of concealed carry. Personal experience does not play a big a role in the gun control debate. Geographic location plays a key role in developing one's opinion on gun control. Gun control is not simply a partisan issue and many different factors influence people's opinions on this topic.

### **Causes of Psychological Distress Among College Students**

Author: Lindsey Barriger

Major: Social Work

Sponsor: Caroline Macke

Psychological distress is a serious social problem, especially among college students. Based on the literature, psychological distress can lead to negative behaviors, poor physical and mental health outcomes, and a decrease in academic performance in college students. This exploratory, cross-sectional study, utilizing a Qualtrics survey, will measure the causes of psychological distress in college students. The results aim to help bridge the gap for social workers and other professionals to better understand the causes of psychological distress in students so they can help target those areas.

### **Metabolic responses of adult Bluntnose Minnows (*Pimephales notatus*) to a range of thermal conditions**

Author: Sam Bauer, Olivia Timmerding, and Emily Steele

Major: Biology, EEO

Sponsor: Richard D. Durtsche

Climatic temperature fluctuations could have a direct effect on fitness and aerobic scope (AS) of fish. Aerobic scope represents the difference in maximum metabolic rate [MMR] and standard metabolic rate [SMR]. We conducted tests on adult minnows (*Pimephales notatus*) to monitor their metabolism under four temperatures (13°C, 18°C, 23°C, and 28°C). Fish metabolism was determined using a static-flow respirometry system. Mass-specific metabolic rates of the fish indicated that uniformity in standard metabolic rate, but statistically different aerobic scopes across temperatures. Fish metabolic performance across temperatures indicates the plasticity of this species in a future warmer climate.

### **Sex Offenders v. Biases in Social Work**

Author: Timothy Beagle

Major: Social Work

Sponsor: Megan Lindsey

Research shows that there are biases and attitudes towards those that are sex offenders which may prohibit them from being productive members of society. The study will help identify the attitudes and biases of current social work students and how it may impact their ability to provide quality care, ongoing support, and how biases on those with a previous sex offense can hinder the process of allowing sex offenders to enter society without judgment.

### **The Impact of Voter Design of Voter Behavior**

Author: Alexis Bensberg

Major: Political Science

Sponsor: Shauna Reilly

How does the design of a ballot influence the decisions a voter makes? Almost every county across the United States is in charge of designing, printing, and distributing their ballots on election day. This means that each county's ballot will look different, both in terms of design and races. However, current research has not examined the impact these differences have on voters. We theorize that variables in ballot design will have a significant impact on roll-off. We gathered data from West Virginia's 2018 ballots and analyzed how their design influenced roll-off. Our findings suggest that there is no significant relationship between ballot design and voter behavior, however more research is needed before this conclusion can be reached.

**Assessing Anxiety-like Behavior in Mice Exposed to Benzo[a]Pyrene During Early Brain Development**

Author: Kevin Berling, Katelyn Clough, Emma Foster, Amanda Honaker, Angela Kyntchev, Conner Perry, Shreya Patel, and Mackenzie Feltner

Major: Neuroscience

Sponsor: Christine Perdan Curran

Benzo[a]pyrene (BaP) is a widespread neurotoxic pollutant found in vehicle emissions, tobacco smoke, and grilled foods. We are trying to determine if genetic differences affect susceptibility to prenatal and early life BaP exposure. We used a mouse model to mimic human variation in three genes related to BaP metabolism and two tests of anxiety-like behavior: Zero Maze and Marble Burying. We found no BaP effect, but mice lacking the enzyme CYP1A1 spent more time in the open area of the maze and buried more marbles than all other genotypes. These results suggest a hyperactive phenotype rather than anxiety-like behavior.

**Performance Analysis of Dedicated Servers and AWS Cloud Computing**

Author: John Besse, Richard Northcutt, and Jo Terino

Major: Computer Science

Sponsor: Traian Marius Truta

Given the novelty of cloud computing and all its purported benefits, it comes into question whether dedicated servers can contend. With an adaptation to the term (into bare metal servers) indicating falling in line with the rapid provisioning capabilities of cloud computing, it shows that dedicated servers are still improving. Cloud computing has well documented cost saving elements which have resulted in its substantial growth, but this paper explores the differences in performance between Amazon Web Services (AWS) Elastic Compute Cloud (EC2) instances and dedicated servers to determine whether those benefits are applicable from a purely performance perspective.

**Molecular Docking of Novel mPGES-1 Inhibitors**

Author: Elise Bezold and Olivia Kendyl Gilliam

Major: Chemistry

Sponsor: Amber Onorato

Nonsteroidal anti-inflammatory drugs (NSAIDs) are the current treatment for inflammation; however, NSAIDs have led to severe cardiovascular and gastrointestinal side effects. Therefore, there is a significant need for next generation anti-inflammatory drugs that do not present these same side effects. This poster is focused on molecular docking studies of compounds as potential inhibitors of a microsomal prostaglandin E2 (mPGES-1), a specific enzyme within the inflammatory pathway known to prevent these severe side effects. The top docking scores will then be compared to biological data, which will lead to a structure-activity relationship that will be applied to further analogue design.



### **Race and Ethnicity: Perceptions and Satisfaction Levels of the Criminal Justice System**

Author: Emily Bowen

Major: Social Work

Sponsor: Jessica Averitt Taylor

National data indicates that minorities are overrepresented in the criminal justice system (CJS), experiencing enhanced arrests, adjudication, and imprisonment. Reports of negative police encounters are prevalent amongst minorities, suggesting that non-minorities experience more favorable interactions. I have implemented an exploratory, cross-sectional survey to determine satisfaction levels of the CJS. Results depicted lower satisfaction levels and perceptions of fairness and safety of the CJS by Black or African American individuals between ages 20-40. This data implies that the CJS responds disproportionately to individuals based on their race or ethnicity, therefore exacerbating the existing avoidance and distrust of law enforcement amongst minorities.

### **Public Perception of the Criminal Justice System: Rehabilitative versus Punitive**

Author: Victoria Brackett

Major: Social Work

Sponsor: Caroline Macke

Research shows that it costs over \$31,000 a year to incarcerate an individual. Furthermore, 50% of individuals who re-enter society will recidivate within 3 years. A variety of programs have proven effective in promoting successful reintegration, thereby reducing recidivism. Societal support for these programs is dependent on society's perception of the criminal justice system as either rehabilitative or punitive. By means of an electronic survey, this study examines people's perception of the criminal justice system, and their subsequent perception of prison-based programming. The findings will help social workers in advocating for a rehabilitative approach within the prison system.

### **Lack Of Access to High Quality Affordable Health Insurance in the United States**

Author: Johanna Bryant

Major: Social Work

Sponsor: Caroline Macke

There is a lack of access to high-quality affordable health insurance in the United States. Research shows that one in five uninsured adults went without needed medical care due to cost. This exploratory, cross-sectional study will examine the prevalence of experiencing stress due to health care costs and how often they avoided seeking health care due to high costs. The results would show that there is significant stress related to high-cost health insurance. These findings can hopefully be used to advocate for more resources to combat this issue.

**ADDICTION IN AMERICA– COULD DECRIMINALIZATION HELP TO REWRITE THE FUTURE?**

Author: Kristen Bryant  
Major: Integrative Studies  
Sponsor: Rhonda Davis

Seventy-thousand six hundred and thirty. That is the number of deaths from 2019 that resulted from drug overdose (CDC, 2020). With this staggering number in mind, it has become a struggle to determine the next steps to take in order to combat this issue that is both directly affecting the lives individuals plagued with substance abuse disorders but also that of their families, friends, and the community at large. A solution that has been tossed around more often in recent times is decriminalization— meaning to alleviate and/or eliminate the criminal penalties for specific actions (in this case, the action of drug use for oneself). At face value, this seems to be a solution that would prompt the complete opposite of improvement for levels of addiction. However, with time and research it is hoped that this argument can help to show just how helpful decriminalization can be in the fight against addiction in America. For this analysis and proposal, both qualitative and quantitative research findings are vital to the argument. The human and sociological factor to this issue cannot be ignored and there is a plethora of research on the psychology behind substance abuse which makes this information readily available.

**Social Work Burnout and Capitalism**

Author: Brooke Buckler  
Major: Social Work  
Sponsor: Megan Lindsey

Research reveals that lower SES is correlated with mental illness. Capitalism creates social classes that formulate an “us versus them” mindset. Research suggests that billionaires have no cap on how much income they can make, and the only way to become a billionaire is by exploiting the working class. Capitalism intentionally reduces resources for those in need because money is valued over lives. Social workers continuously run into dead ends and sometimes our clients basic needs are unable to be met. A brief survey was given to social workers to assess if reasoning for burnout is correlated with capitalist policies.

**Social Work student’s stress during a pandemic**

Author: Casey Bushelman  
Major: Social Work  
Sponsor: Megan Lindsey

Student’s ability to manage academic stress is a social problem in the United States. The pandemic is so new, there is not enough literature to support the effects of how this pandemic has affected student’s emotional health and the ability to measure stress. Students are unaware of how to deal with the effects of the pandemic and the effects it has on their studies. They are also unaware of the services that are available to help with positive coping skills.

### **Selection Efficiencies of ISS-CREAM via MC Simulation**

Author: Brian Butler

Major: Physics

Sponsor: Scott Nutter

The ISS-CREAM instrument studies the composition of cosmic rays, charged particles that permeate the galaxy. The objective of ISS-CREAM is to measure the energy and charge of cosmic rays from low earth orbit to help astro- and high energy particle physicists understand their propagation origins. ISS-CREAM makes measurements of every CR that passes through but doesn't necessarily "see" all of them. In order to correct measurements, we need to produce what is called a flux. In order to do that, we need to determine an efficiency, which is a ratio of the number of particles passing selected cut methods to the total possible particles produced from either the flight data or modeled via GEANT-4 and analyzed with ROOT.

### **Raising Awareness for Coral Reefs**

Author: Bianca Calipo

Major: Media Informatics and Integrative Studies

Sponsor: Steven Watkins

According to National Geographic, the diversity in coral reefs rivals that of the Amazon rainforest- an estimation of 2 million species rely on these underwater animals. Because of this, they are foundational to the ecosystem as a whole, and by extension, us. Their biodiversity has been key in developing drugs to help find cures for many illnesses and diseases, such as cancer, as well as allowing fisheries and other businesses to thrive. Coral Reefs also act as a shield to protect shorelines from violent waves and storms, including areas where people live. This creative project will cumulate into a poetry collection with full illustrations, in order to raise awareness for these threatened, incredibly important animals.

### **Statistical Consulting Projects with St. Elizabeth Healthcare**

Author: Brianna Casey

Major: Statistics

Sponsor: Joseph Nolan

The Burkardt Center often collaborates with professionals at St. Elizabeth Medical Center. Here I present examples of statistical methods utilized in three such collaborations. The first is a diabetic study where the goal was to improve patient care. The second study attempted to find association between family presence and duration of CPR and/or return of patient's circulation. Finally, the third evaluated use of sleeping medication study and its impact when used based on past/present patient diagnosis. From a statistical perspective, these three studies were all completed using basic statistical methods such as chi-square test, T-tests, ANOVA, and logistic regression.

### **An Updated Survey of KVM and Docker Performance**

Author: Terry Chauvin, Brandon Mefford, and Alex DeVore

Major: Computer Science and Computer Information Technology

Sponsor: Traian Marius Truta

Virtualization technologies are becoming more prevalent in the enterprise and consumer space. Many companies are opting for either on premises or in the cloud virtualization platforms for hosting their applications. In the pursuit of less overhead and more performance a newer virtualization technology, which offers a different way of packaging and deploying business applications as containers, has started to appear. One of the most common open-source versions of this is Docker, which facilitates this process through the use of the Docker Engine and containers. We will provide background information on what each of these technologies are and their most effective use cases as well as an evaluation and comparison of virtual machine performance, using a Kernel-Based Virtual Machine (KVM) and container performance utilizing the Docker Engine.

### **Prescription Drug Abuse on College Campuses**

Author: Isabel Childs

Major: Social Work

Sponsor: Caroline Macke

Prescription drug abuse is an epidemic that persists across all populations. It is the use of medication without a prescription from a healthcare provider, for nonmedical purposes, or in excess of what is prescribed. This exploratory cross-sectional study aims to examine the prevalence of prescription drug abuse on college campuses and the reasons for the abuse. Data will be collected through a self-administered survey and is expected to demonstrate a high prevalence of abuse due to environmental, social, and intrapersonal factors. The findings will assist helping professionals and educators alike in improving the health and functioning of college students.

### **Public Opinion of Female Political Leadership**

Author: Faith Chitkara

Major: Political Science

Sponsor: Shauna Reilly

The theory that the public opinion of female political leadership is significantly influenced by demographics, such as gender, is widely supported by large amounts of existing academic literature. In examining this theory further, specifically through survey conduction, it is clear that a respondent's gender identity heavily influenced their perception of female political leadership, and the literature reflects that expectations, societal and political norms, personality traits are all subjective to a candidate's gender. Thus, there is a difference between the way in which female and male candidates are perceived by the public. The ultimate purpose of this paper is to highlight how demographics influence and shape the public's opinion on female political leadership through a thorough examination of survey data collected, as well as existing academic literature. The theory was broken down into two more specific supporting hypotheses. The results of the survey conducted are reflective of the two hypotheses and theory at hand, as demographics, specifically gender, did indeed influence the public perception of female political leadership, which revealed non-binary individuals to favor female political leadership more than men and women, but women more than men.

**Public Opinion, American Drug Policy**

Author: Blake Clark

Major: Social Studies Secondary Education

Sponsor: Shauna Reilly

This study examined public opinion on American drug policy. The study investigated whether Republicans were more likely to feel that drug abuse was a more serious problem than their Democratic counterparts, whether Republicans were less likely to support legalizing marijuana for recreational use, and whether those with personal connections to those affected by drug abuse are more likely to support harm reduction policies like needle exchange programs and methadone treatments.

**Sex-Specific Gene Expression Associated with Zinc Homeostasis in Squirrelfish**

Author: Joseph Clark

Major: Biology

Sponsor: David Thompson

We looked at differential gene expression in squirrelfish at two different times of the year. We are specifically trying to determine if there is an upregulation in zinc transporting genes during breeding season when compared to nonbreeding season. Our results showed an upregulation in *zip4* and *zip10* in females compared to males and in November females compared to June females.

**Using High-Performance Liquid Chromatography to Assess Genetic Susceptibility to Gestational and Lactational Benzo[a]pyrene Exposure**

Author: Katie Clough, Emma Foster, and Lisa Massie

Major: Neuroscience

Sponsor: Chris Curran

Traffic-related air pollution is a complex mixture that includes the neurotoxic polycyclic aromatic hydrocarbon benzo[a]pyrene. We use mice to model human genetic variation in genes related to BaP metabolism to identify those at higher risk from early life exposure. Following behavioral testing of mice exposed to BaP during pregnancy and breast-feeding, we measure neurotransmitter levels in multiple brain regions. We found significant differences in levels of both dopamine and serotonin and their metabolites. The greatest changes were in the hippocampus which has a critical role in learning and memory and the prefrontal cortex which is required for normal cognitive function.

### **Death Exposure and Advance Care Plan Completion**

Author: Kieran Conway

Major: Social Work

Sponsor: Jessica Averitt Taylor

Research suggests there are several barriers preventing people from planning for end-of-life care, such as completing Advance Care Plans (ACP). Without these directives to guide medical care, quality of end-of-life is diminished. The purpose of this study, conducted by a brief survey distributed via social media, is to investigate the connection between previous death exposure and adult completion of ACP. The results should demonstrate that previous positive death experiences decrease death anxiety, thereby increasing ACP completion and increasing quality of end-of-life. These findings will direct clinicians' approach to end-of-life conversations by removing some of the barriers to planning for end-of-life.

### **The Impact Of Policing On Mental Illness**

Author: Tarin Cook

Major: Social Work

Sponsor: Jessica Averitt Taylor

America maintains the highest incarceration rates among developed nations. As a result of America's lack of appropriate mental health crisis response, individuals with mental illness are disproportionately overrepresented in the criminal justice system. Through a brief self-administered perception-based survey, respondents felt social worker were safer and more knowledgeable in de-escalating a mental health-based crisis versus police. Unnecessary contact with the criminal justice system due to a mental illness-based crisis effects incarceration rates, cost to the community, and has long-term impact on the individuals. Implementing social workers in police departments will save time, money, and lives.

### **Public Opinion on Free Speech: An Analysis of Satisfaction and Partisanship**

Author: Stephen Cordle

Major: Political Science

Sponsor: Shauna Reilly

The existing literature that investigates public opinion on free speech indicates that Americans support the principle but not the practice of free speech. To investigate the relationship between free speech satisfaction and partisanship, two hypotheses are postulated and tested based on the results of a 20-question public opinion survey. The findings of the survey support both hypotheses and reveal that there is a relationship between partisanship and free speech satisfaction. However, due to the demographic makeup of respondents, it is unclear if this relationship is applicable to Democrats as well as Republicans.

### **Discrimination and Discipline Disparities**

Author: Asha Cornett

Major: Social Work

Sponsor: Jessica Averitt Taylor

Discipline disparities affect students of color at a disproportionately high rate. Resulting punishments are often repetitive and unjust, with limited consideration for underlying challenges and societal structures. This exploratory, cross-sectional study will utilize non-probability, voluntary response sampling to examine the relationship between discrimination and disciplinary actions amongst college students. I anticipate that the results will display increased discipline actions for students of color. This data will provide a foundation for the development of social work practices to alleviate disparities in education settings. This data will also provide insights regarding policy and advocacy efforts, and future research to address the issue.

### **Gender Difference in Help-Seeking Behavior on Mental Illness Among College Students**

Author: Morgan Couch

Major: Social Work

Sponsor: Reiko Ozaki

The prevalence of mental illness in any form has shown a greater impact on women than it has men. This cross-sectional study collected self-reported data using the online survey program Qualtrics, will seek to understand the difference in men and women in their decision to seek help if they were dealing with a mental illness. It is anticipated that women are more likely to seek help than men. This data can be used to identify how social workers, researchers, and universities can provide better opportunities for both men and women to feel comfortable seeking help for mental illness.

### **Analyzing the Response to the COVID-19 Pandemic**

Author: Andrew Cox

Major: Statistics

Sponsor: David Agard, Joe Nolan, and Shauna Reilly

The COVID-19 pandemic created difficult choices for state leadership to make to manage the spread of the virus. Daily COVID-19 data were analyzed to assess the impact of political party on the spread. Two-sample t-tests were used to determine if there is a difference in the mean of a maximum 7-day period of positive cases based on party affiliation as well as gender. Evidence suggests that states with Democrat leadership of the House of Representatives and Senate had lower COVID-19 case rates as compared to states with Republican leadership. Some other differences were also observed.

**Human Trafficking**

Author: Amanda Daugherty  
Major: Social Work  
Sponsor: Caroline Macke

Human Trafficking is the recruitment, transportation, transfer, harboring, or receipt of persons by improper means for an improper purpose. An estimated 21 to 45 million people in the world today are trapped in some form of human trafficking. This study, which utilizes an electronic survey, will explore the portrayal of human trafficking in the media and misconceptions surrounding this social problem. Specifically, the survey will examine Northern Kentucky and Cincinnati residents' knowledge of modern day human trafficking. The findings will assist social workers as they strive to raise awareness about this social problem.

**Intergenerational Contact in Younger Adults and its Effect on Aging Anxiety, Attitudes, and Future Time Perspective**

Author: Emily Davis  
Major: Psychology  
Sponsor: Allyson Graf

Intergenerational contact has shown to be associated with aging anxiety, ageist attitudes, and future time perspective. In past studies, more aging anxiety and ageist attitudes had negative associations with future time perspective, and intergenerational contact has shown to reduce these views. However, the majority of these studies have focused on older adults. The goal of this study was to examine multiple correlations between family and non-family intergenerational contact, aging anxiety, ambivalent ageist attitudes, and future time perspective in young adults. It was hypothesized that these correlations would create a theoretical pathway from intergenerational contact to future time perspective. Results revealed that the majority of these correlations were significant in the expected directions and that the model was significant to future time perspective. These results indicate that interactions with older adults and views on aging can create significant influences on how young adults perceive their future.

**The Student Debt Crisis: Current Experiences and Future Implications**

Author: Rebecca Davis  
Major: Social Work  
Sponsor: Jessica Averitt Taylor

The student debt crisis affects 45 million Americans and has been linked to a decrease in mental, physical, financial, and social wellbeing. This exploratory, cross-sectional study utilizes a self-administered survey to analyze the current perceptions of student debt amongst past and current students, helping to bridge the gap on the short- and long-term effects. Exploring these impacts will help make positive changes at micro, mezzo, and macro levels in addition to exploring effective ways to assist those with debt. Results suggest that student debt affects the following life decisions: marriage, having children, buying a home, and choosing a career.



**NKU CURE-Course-Base Research Experience**

Author: Kenna DeLuca

Major: BioChemistry

Sponsor: Lili Ma

Traditional laboratory class structures have focused on problems or ideas that have already been experimented. However, a novel approach to the restructure of laboratory classes has been brought up. It is called Course-based Undergraduate Research Experience or CURE. This is a laboratory class setting that focuses on exposing undergraduates to scientific research. In this laboratory class structure, students perform original research to potentially create bioactive molecules. Students enrolled in the CURE labs not only gain hands-on knowledge of modern equipment and digital tools used in organic chemistry research but also gain “soft” scientific skills such as scientific collaboration and communication[8]. Through studies, it has been shown that learning current research methods and skills increases student success. In addition, when CURE is compared to traditional and expository activities students have shown increased learning.

**Impact of Maternal Helminths on Learning and Memory**

Author: Olivia DeMoisey and Madee Weaver

Major: Biology

Sponsor: Lauren Williamson

Neuroinflammation is very serious and if it occurs during development, it can have lasting debilitating effects, including cognitive impairments and altered immune function. In the central nervous system (CNS), there are immune cells called microglia that are activated during brain immune challenges and in the inflammatory process. Helminths have been shown to attenuate cognitive dysfunction and inflammation when given to mother and pup, though little is known about how the helminths attenuate neuroinflammation in the rats. We examined the effects of only maternal helminth treatment on her offspring. We assessed CNS gene expression in early life with RT-PCR and used a context preexposure facilitation effect paradigm to test hippocampal function in adult offspring. Hippocampal tissue was taken at postnatal day 1 and 4 and analysis showed a difference due to maternal helminth treatment, sex, and age on varying chemokines and cytokines. Analysis of the CPFE paradigm showed that regardless of experimental condition, females froze more than males. This means that they were able to associate the foot shock with the context better than males. In the future we hope to add more power to this project by adding more rats to the CPFE paradigm and analyzing tissue from postnatal days 5 and 7.

**The Influence of Bourbon Whiskey On Kentucky**

Author: Mia Derks

Major: History and International Studies

Sponsor: Andrea Watkins

Through the lens of one of the state's most famous commodities, bourbon whiskey, this project seeks to explore the history and culture of Kentucky. Bourbon whiskey has been a defining feature of the state since its conception, and as such, it has been very influential in the development of the state's history, its unique social and cultural identity, and its relevance in the modern era.

### **Sex Crimes on College Campuses: Creating a Safe Space**

Author: Joshua Dinger  
Major: Integrative Studies  
Sponsor: Steven Watkins

My presentation and research paper both focus on the way in which universities inadequately respond to cases of sexual assault on their campuses. First by exemplifying just how frequent these crimes are committed, researching how these scenarios of abuse begin, and then finding how their respective universities would respond, I have come to assemble a few proposed solutions for the schools. Attempting to change the experimental culture that surrounds university life may not be possible, but at the very least, universities should be the first one's to want to make any changes necessary to keep their students safe.

### **Behind the Wizard's Curtain**

Author: Lizz Dobmeyer  
Major: History  
Sponsor: Rebecca Bailey

This presentation discusses the Independent Study I undertook this semester with Dr. Rebecca Bailey where we did a deep-dive into collegiate pedagogical principles, and college course construction. I discuss some of the principles we went into, as well as the course module we designed.

### **Image Processing of Transiting Exoplanets with the NKU 14-inch Telescope**

Author: David Dodge  
Major: Data Science  
Sponsor: Nathan De Lee

NKU's Schneider Observatory, located on campus atop Founder's Hall, features a 14-inch Schmidt-Cassegrain telescope mounted on a German equatorial mount with computer control capabilities. The high precision of this telescope system allows us to perform differential photometry of variable objects with sufficient sensitivity to detect exoplanets. Research is continuing on developing a custom image processing pipeline, which will enable us to produce light curves with complete control over the processing techniques. In this presentation, we will discuss the preliminary data we have been able to obtain with the telescope as well as the benefits and challenges of constructing an image processing pipeline from scratch.

**Phosphoenolpyruvate carboxykinase (pck) and Iroquois (irx) genes play diverse roles during embryonic development**

Author: Kelsey Donahue

Major: Biological Sciences

Sponsor: Emily Shifley

During development, cells in vertebrate embryos differentiate to form adult tissues and organs via a structure known as the pharynx. Many genetic signaling pathways, such as the Fibroblast Growth Factor (FGF) pathway, are used by these cells to communicate and coordinate their development. As a result, if these genetic signals are disrupted, birth defects can result. From previous hypotheses regarding the potential targets of pathways such as the FGF, we identified two classes of genes that were potentially being expressed during embryonic development and that could give rise to such birth defects. We analyzed both pck and irx gene expression with in-situ hybridization and determined the tissue layers each of the genes were expressed in by sectioning the embryos via vibratome. Our results show that pck1 and 2 are expressed in the ectoderm, a tissue that forms the skin and nervous system, suggesting that these genes may play important roles in the development of the skin. Irx genes were expressed in the mesoderm and endoderm areas, contributing to the development of the gut and other internal organs. Additionally, some embryos injected with an Irx morpholino illustrated differences in expression patterns. These results contribute to our understanding of the evolution and roles the pck and irx genes play during embryonic development.

**The influence of diet and lifestyle on precocious puberty in males and females.**

Author: Kelsey Donaldson

Major: Biology

Sponsor: Emily Shifley

Male and female pubertal onset age has decreased over the past 150 years and this trend has been associated with diet and lifestyle. Obesity in females has been associated with early menarche age, as well as general increased adult body mass index (BMI). An unhealthy diet leads to precocious puberty in males. However, obesity is thought to lead to delayed growth in males. This can lead to health concerns later in life. Females have an increased risk of hypertension, diabetes, breast cancer, and endometrial cancer as well as mental health repercussions such as depression and antisocial behavior. Males have an increased risk of testicular cancer, shorter stature, substance abuse, and depression. As 18.5% of American children suffer from obesity, it is important to encourage children to exercise and inform parents of the risks of precocious puberty. In order to inform the public of this issue, an event called "Hike for Your Health" was initiated. Families would exercise and then record their time spent exercising in a GoogleSheets form. Although the scope of the project was limited, it accomplished its goal of informing families of the risks of precocious puberty and was successful at having participating families undergo physical activity.

### **Addiction and COVID-19**

Author: Elizabeth Dubovsky  
Major: Social Work  
Sponsor: Caroline Macke

Addictions are influenced by genetics, neurobiology, past experiences, and stressors. Social isolation due to COVID-19 is especially stressful for addicts. The purpose of this study is to examine the impact of the pandemic on the frequency of drug use. Using an electronic questionnaire, this study will compare the frequency of illicit substance use prior to and during the pandemic. The findings are expected to show that drug use has increased since the COVID-19 pandemic. In turn, these findings will help advocate for the allocation of resources to substance use prevention and intervention programs.

### **Hopewell Earthworks: Lessons on Culture and History**

Author: Peter Duke  
Major: Anthropology  
Sponsor: Judy Voelker

Ancient Native American cultures and history remains largely unknown among the general population of the United States. This presentation focuses on a display developed for the NKU Anthropology Museum that will assist students and others in understanding past Native cultures and the prehistory of southwest Ohio. The project has included library research, on-site visits, and visual documentation of Hopewell culture in our region. This project is timely because the majority of the Hopewell archaeological sites studied are nominated for the prestigious UNESCO designation of World Heritage Site.

### **The Impact of Intersecting Identities and Disclosure Salience on Experiences of Hiring Discrimination**

Author: Hannah Dykes  
Major: Industrial-Organizational Psychology  
Sponsor: Kinsey Bryant-Lees

The current study aims to experimentally investigate the experiences of hiring discrimination based on traits such as gender identity and mental health status. Participants (N = 193) were asked to read a job description and rate the LinkedIn style profiles of eight different fictitious applicants on characteristics such as role suitability, likeability as a coworker, and overall hireability. Participants were then asked to recall and select which three profiles they would most recommend for hire. Results suggest that profiles that disclosed a nontraditional gender identity or mental health message were rated as less suitable for the position, less likeable as a coworker, and less hireable overall than profiles that did not disclose a nontraditional gender identity or mental health message. Further research is needed to confirm and expand on results.

**Adverse Childhood Experiences Change Adulthood**

Author: Kaila Earehart

Major: Integrative Studies

Sponsor: Rhonda Davis

Early childhood events can unknowingly impact a person's entire adult life. Learning some of what the milestones are for early childhood development is very important if a person works inside of a school. Being able to know these signs could potentially stop an Adverse Childhood Experience (ACE) from happening. Studies show the one in six people have experienced something of the sorts early on which explains why some people are the way they are in their adult life. Students causing problems in the classroom could scratch just the surface of what is actually going on in a tiny human's life. It is up to the adults in any room where children learn and grow have a responsibility to recognize it and take action.

**Another School Shooting? Definitional Challenges**

Author: Sabrina Edmondson

Major: Criminal Justice

Sponsor: Melissa Moon

My presentation documents the challenges of defining and measuring school shootings. Each and every database defines school shootings differently so the number of incidents changes depending on the source. In analyzing 5 different databases, some surprising results emerged in the form of line graphs to depict just how different each database may be from one another. Is that 'school shooting' you just heard about the type of incident you're imagining in your head, or is it something else entirely?

**Synthesis of heteroaryl molecules through a palladium-catalyzed heteroarylation**

Author: Callie Elder

Major: Biological Science

Sponsor: Lili Ma

Undergraduate Research in Organic Chemistry Courses (UROCC) at Northern Kentucky University is based on the Course-based Undergraduate Research Experiences (CURE) model. In this class we used techniques like NMR, MPCL, and computer modeling to purify, identify, and evaluate a number of different compounds. The specific compounds that I worked with during these experiments were I80 (tropinone)-H40 (6-bromoquinoline) and I80-H9H (4-Bromothiazole). Heteroaryl compounds, like I80-H40 and I80-H9H, are common and important in medicinal chemistry. The research that we are conducting in this class provides useful information concerning heteroaryls and the possibility of it being a bio active molecule that can be used as a breast cancer treatment.

**Motor function changes in three genotypes of mice exposed to benzo[a]pyrene during gestation and lactation**

Author: Mackenzie Feltner, Katie Clough, Emma Foster, Angela Kyntchev, Aria Towell, Shreyaben Patel, Amanda Honaker, Connor Perry, and Kevin Berling

Major: Neuroscience

Sponsor: Chris Curran

Benzo[a]pyrene (BaP) is a known carcinogen found in automobile exhaust, wood fire smoke, tobacco smoke, grilled food and coal tar. Many studies found exposure to these pollutants during pregnancy can damage genes and the placenta and impair fetal growth. We use mice that mimic human genetic variation in genes related to BaP metabolism to identify those at highest risk. In this study, we looked at motor function in adult mice exposed to BaP during gestation and lactation. We found no effect of genotype, but discovered Cyp1a2 knockout mice have deficits in motor coordination on the rotarod test.

**Rate of Incidence in Intimate Partner Violence in Same-Sex versus Mixed-Sex Couples**

Author: Laura Ferrarelli

Major: Social Work

Sponsor: Megan Lindsey

Despite the myth that intimate partner violence occurs exclusively in heterosexual couples, research suggests that incidence rates are comparable if not higher in same- sex couples. The purpose of this study is to examine the rate of incidence (ROI) of intimate partner violence (IPV) in same-sex couples versus mixed-sex couples. A brief, self – administered survey will be used to assess for sexuality and rate of incidence. Due to the limited research on this topic, it is essential to create a safe space where this subject can be openly discussed and addressed

**Campus Climate: Perceptions and Impacts among LGBTQ+ College Students**

Author: Samantha Fitzpatrick

Major: Social Work

Sponsor: Jessica Averitt Taylor

Perceptions of campus climate significantly impact students' academic achievement and level of satisfaction with their university. It is only within the last decade that research has begun to examine the effects of campus climate on sexual minority groups. A brief, self-administered survey will assess perceptions of campus climate among college students. The anticipated results will show that negative perceptions of campus climate have a negative impact on students' academic success and mental health. Results will bridge the gap in knowledge, provide insight into how to better serve students' needs, and inform policy and advocacy initiatives to promote inclusivity at NKU.

**An upgrade to the traditional organic chemistry lab**

Author: Ashley Flanigan

Major: Biology

Sponsor: Lili Ma

Traditionally, organic chemistry lab students perform experiments that are known to work time and time again. The main purpose of the Undergraduate Research in Organic Chemistry Course (UROCC) is for students to incorporate modern lab techniques and digital tools, scientific thinking, and collaboration. Students get to implement these skills by conducting research to synthesize bioactive heterocyclic tropinone derivatives in an attempt to develop a drug candidate for breast cancer. UROCC gives students the opportunity to learn lab techniques combined with a research project and is designed to provide them experience needed to succeed in a career in science.

**Perceptions of Steroid Usage Compared to Other Recreational/Illicit Drugs**

Author: Lindsay Fowler

Major: Social Work

Sponsor: Megan Lindsey

The use of steroids has always been problematic in and out of universities throughout the United States. The purpose of this research is to determine the perceptions people have on the use of steroids when compared to other recreational and illicit drugs. An online survey will be used to collect the data from people over the age of eighteen. The research will give a better understanding of the perceptions people over the age of eighteen have on the use of steroids when compared to other recreational and illicit drugs.

**Star Formation: Modelling the Collapse of a Dense Core**

Author: Daniel Franklin

Major: Physics/Applied Mathematics

Sponsor: Lisa Holden

Stars begin their life in molecular clouds: areas of dense gas in the interstellar medium that are threaded by magnetic fields. Within these molecular clouds, the gas is distributed unevenly resulting in denser regions known as cores. Star formation is thought to begin when a core loses support from its magnetic field and material from the core begins to “fall in” making the core even denser. Once this overdense region of gas has formed, collapse is inevitable and a young star is formed. Using a classic partial differential equation model of this process as a starting point, we explore how the relationship between a core’s pressure and density influences the timeline of the core’s collapse.

**A Comparison of Career-Related Development between Student-Athletes and Non-Student-Athletes**

Author: Kaelin Gentile and Taryn Taugher

Major: Psychology

Sponsor: Robin Bartlett

Recent research has been conducted studying different forms of identity, in this case, career identity and athletic identity. Previous studies found lower levels of career exploration within college student-athletes (those who scored high in athletic identity). The current study builds upon this idea, testing if college student-athletes have lower levels of career development compared to non-student-athletes. A sample of athletes and non-athletes participated in surveys testing these two forms of identity. We found no differences between the groups regarding career development. This trend continued when comparing upperclassmen student-athletes to underclassmen athletes and non-athletes.

**Religiosity and the Moral Compass: American Moral Perspectives on Sex Work**

Author: Elizabeth George

Major: Political Science

Sponsor: Shauna Reilly

Sex work is an everyday occurrence here in the United States, but what drives public opinion on it? Religion has shown itself to be one of the main factors in this area. So how then do religiosity and public opinions of sex work interact? A test of public opinion on the matter was conducted on 204 respondents, and a link between support for increases in religiosity or other moral concerns being linked to an increase in moral concern for sex work, or vice versa, was found. However, the relationships were discovered to be nonlinear and not linear as previously thought.

**Retail store sales and markdown effects**

Author: Shikha Ghodeswar

Major: Business Informatics

Sponsor: Kalyani Ankem

Businesses often look to holidays to thrive or even survive (Martinez, 2018; Moin & Hays, 2020; Clark, 2020; Wahba, 2017). They use merchandising strategies (Mitchell, 2020), including sensory marketing (Şteliac & Şteliac, 2018) during holidays to boost sales. Also, external factors such as weather have been used in sales forecasting (Nalcaci, 2019; Steinker et al., 2017). This research studies the effect, specifically, of markdowns during holidays.



**Improving Diversity Aspects Within Libraries Using Organizational Leadership: An Integrative Approach**

Author: Aaron Gibbs

Major: Integrative Studies

Sponsor: Rhonda Davis

The library profession recognizes the need for access to library and information resources, services, etc. by all people. Diversity and inclusion is an issue that librarians and patrons face. To combat these issues, I implemented a service-oriented project as a librarian at the Morgan County Public Library. The project included: diversifying library materials, staff diversity and inclusion training, inclusion posters, and library programming. I was able to promote and demonstrate the need for diversity and inclusion in my library through measured outcomes and participation from library staff and patrons, utilizing focus areas in Library Informatics and Organizational Leadership.

**Covid-19 Misconceptions**

Author: Felicity Gloeckner

Major: Integrative Studies

Sponsor: Rhonda Davis

Covid-19 has very quickly taken over our world and has unfortunately cost many people their lives. These unnecessary deaths have been linked to people who have not taken this pandemic seriously with myths and disinformation partially to blame. Because of this, I sought to help us identify the misconceptions and myths, disprove them, and then examine what we can do to help discourage their creation. I examined the currently circulating myths and then examined them through the lens of several disciplines. After doing this I learned that myths are extremely wide spread and have led to more deaths than necessary.

**Critical Evaluation of HDAC8 Inhibition via Computer Modeling**

Author: Adrianna Goodwin

Major: Chemistry and Biological Sciences

Sponsor: Lili Ma

Histone deacetylase (HDAC) is an enzyme that removes acetyl groups from histones to make DNA inaccessible. HDACs are commonly overexpressed in many cancers. Inhibition of HDAC has the potential to trigger growth arrest and apoptosis. Class-I HDACs are zinc-dependent, and therefore inhibitors typically feature zinc-binding groups. The research project examines inhibitor interactions with HDAC8 via docking of each inhibitor into the protein in various conformations. The docking studies were completed utilizing the modeling programs GOLD and MOE. The GOLD program was utilized to determine binding affinity between ligand and protein. The results were used to compare inhibitors by zinc-binding groups.

**In vitro reconstitution of the shikimate pathway: a new tool for probing MST enzyme mechanisms**

Author: Simon Gores, Anna Askren, and Catherine L. Shelton

Major: Biochemistry

Sponsor: Catie Shelton

The MST enzymes (menaquinone, siderophore, tryptophan) are structurally homologous proteins that utilize chorismate in the biosynthetic pathways that generate aromatic amino acids, folate, quinones, and siderophores. Inhibitors of these enzymes could serve as new antibiotics. To help inform inhibitor design our lab will measure kinetic isotope effects in MST enzymes using isotopically labeled chorismate. Chorismate is naturally synthesized in bacteria, fungi, and plants with the seven-enzyme shikimate pathway. Here we report the in vitro reconstitution of the shikimate pathway utilizing heterologously expressed shikimate enzymes combined with substrates and cofactors in a one-pot reaction to generate chorismate.

**Human Trafficking through Social Media**

Author: Taylor Graham

Major: Social Work

Sponsor: Caroline Macke

The literature indicates that human trafficking victims in the United States are often recruited through social media. An electronic, self-administered survey will be used to determine the extent to which people are aware of the online methods by which perpetrators of human trafficking reach their potential victims. The findings of this cross-sectional study are expected to show a low level of public awareness on how perpetrators of human trafficking are able to reach their victims through social media. These findings may help social workers and other professionals as they develop educational programming related to this social problem.

**Covid-19 Pandemic and School Closures affect on Students**

Author: Mark Gray

Major: Interdisciplinary Studies

Sponsor: Rhonda Davis

We look into the past to see the History on how things affected students during Hurricane Katrina and the Influenzas pandemic of 1918, I then touch on some facts from the educational side of things and how test scores show problems moving forward especially in Math. I interviewed two local teachers for first hand information. Matt Shafer a High School Principal and got his input on how things are being handled from a leadership perspective. We do not yet know the full affects from this pandemic. But we will overcome. Afterall this is the greatest country in the world.

### **The Effect of Covid-19 On Student Athletes' Mental Health**

Author: Logan Griffin

Major: Organizational Leadership

Sponsor: Megan Downing

Covid-19 has had a broad reaching, global impact at every level of society. It may take years to fully understand the societal, economic, and overall impact of this persistent virus, but some areas of impact have been glaringly obvious as society navigates evolving pandemic safety precautions and scientific understanding of the virus. One area of significant impact is in student athletics. Isolation, lost opportunity for play and competition, and an ongoing world of uncertainty have been ever present for student athletes. Through the lens of social cognitive theory, this study explores the impact of Covid-19 on student athletes' mental health through an examination of current studies and qualitative semi-structured personal interviews with athletes and coaches. Findings indicate increased stress and anxiety, difficulty concentration, disrupted sleeping patterns, and academic performance concerns. Positive and negative influences are explored and recommendations for intervention and preventative strategies to address mental health impacts are offered.

### **Ramifications of Childhood Adversity on Academic Success**

Author: Alondra Griffith

Major: Social Work

Sponsor: Megan Lindsey

The ramification of experiencing one ruinous event or a progression of events during childhood has shown to induce deleterious effects on an individual's cognitive prosperity and level of academic accomplishments. The current cross-sectional study seeks to examine the relationship between childhood maltreatment and academic success. A self-administered survey was distributed to 50 NKU students. The results of this study are expected to provide statistical evidence to support a higher estimated risk of poor academic engagement and academic performance for NKU students with adverse childhood experiences. Results will augment social awareness of the negative impact childhood trauma has on academic success.

### **Preventing Stigma and Violence against LGBTQ+ Society through Television Tropes and Mainstream Media**

Author: Tessa Grigson

Major: Integrative Studies

Sponsor: Rhonda Davis

The motivation behind this research was to find solutions for the often negative and stereotypical tropes associated with LGBTQ+ narratives that contribute to stigma and violence against LGBTQ+ society. The solution I have proposed to this complex problem is to mainstream queer-heroes who survive their depictions. I researched this complex problem through various disciplinary perspectives such as psychology, history, criminal justice, sociology and literature & film. I believe there is still room for research in more scholarly conversations that pertain to this complex problem. In conclusion, I welcome new and alternative contributions to the conversation of this complex problem.

**The Relationship Between Anxiety and Controlling Behavior**

Author: Kathryn Grinstead

Major: Social Work

Sponsor: Caroline Macke

Research suggests that those with anxiety tend to feel the need to control things around them in order to feel at ease. However, controlling behavior has never been identified as a coping strategy, and very little is known about this behavior in the realms of anxiety. This cross-sectional, self-administered survey will examine the prevalence of controlling behavior and how it is associated with anxiety. The results from this survey are expected to show that there is a direct relationship between anxiety and controlling behavior. These findings can aid social workers and other mental health professionals in the fight against anxiety.

**Barriers sexual minorities face when adopting**

Author: Tosha Habig

Major: Social Work

Sponsor: Megan Lindsay

There are estimated 673,000 children in foster care in the United States, with 122,000 waiting to be adopted yearly. However, there are currently over 2 million Sexual Minorities (SM) that are interested in adoption but due to multiple barriers are unable to adopt. There has been little research into the barriers that SM individuals face while attempting to adopt. A brief self-administered survey given to SM individuals who have experienced this process will assist in exploring those barriers. This data can assist in exploring ways to reduce barriers for prospective SM parents so that there are more loving homes available.

**Tropinone Synthesis using Palladium Catalysts, a Course-based Undergraduate Research Experience (CURE)**

Author: Ryan Hall

Major: Chemistry

Sponsor: Lili Ma

Cancer is the second leading cause of death in the United States with 599,601 deaths in 2019, only behind heart disease. The significance of our research is dedicated to synthesizing novel molecules that could go towards the fight against this challenging disease. While our team focused on a variety of molecules, the molecule I synthesized, I80-H40, showed encouraging signs by computer modeling that it could be a bioactive molecule. From this, further studying and purification can be performed to investigate its potential in fighting breast cancer.

### **Child Abuse & Neglect among those Living with a Disability**

Author: Jasmine Harris

Major: Social Work

Sponsor: Caroline Macke

Many children in the U.S. are currently experiencing one or more forms of child abuse and neglect. Research shows that children with disabilities are at increased risk for experiencing child abuse. When striving to prevent child abuse within this population, it is important to examine parenting styles since parenting styles may influence the type of discipline used by the parent. This cross-sectional study, which uses an electronic survey, examines whether the disability status of the parent and the child impact the parenting style. The results from this study will further inform social workers who are working to prevent child abuse.

### **Grief and the Impact of Spiritual Beliefs**

Author: Karis Hawkins

Major: Social Work

Sponsor: Megan Lindsey

Loss and Grief is a topic that impacts everyone in the world. Many individuals struggle with the grief process and the negative effect it can have on one's life, including one's own mental health. The purpose of this study is to gain an understanding of how one's Spiritual beliefs may impact their grief journey. Several interviews were completed to gain a firsthand account of how their spiritual beliefs impacted their grief process. These results will help the mental health field gain a deeper understanding of how our belief systems can impact grief in a positive way.

### **The Intersectionality of Substance Use & Mental Health**

Author: Deanna Hengge

Major: Social Work

Sponsor: Jessica Averitt Taylor

College-age young adults face intense pressure to define themselves socially and pre-professionally which impacts their mental health and substance use is prevalent amongst their peers. The purpose of this study was to determine whether college students' mental health impacts their substance use. This exploratory, cross-sectional study utilized non-probability, purposive sampling to collect data from 113 college-aged students. Data was collected by means of a self-administered 5-minute survey distributed digitally via the researcher's networks. The results helped inform if there is a greater need to address the co-occurrence of substance use and worsening mental health.

### **The issue of unequal pay for women in sports in the US**

Author: Alondra Hernandez  
Major: Organizational Leadership  
Sponsor: Dr. Megan Downing

Social role theory notes that accepted gender hierarchy and division of labor in society is derived from society's observation of men and women and their role performances. Societal beliefs about sexes are informed by these ongoing observations, and societal norms are established and accepted as a result. In other words, the key differences among the sexes and the beliefs people hold about them are primarily influenced from the way social roles are distributed to men and women within society. Research has shown, and legal precedents have been set on this notion, that labor markets (not employers) are the source of inequality. The gendering of sports has the potential to affect how and to whom a particular sport is marketed, therefore dampening market opportunities for women. At present, male athletes not only receive more money to play, they also earn more than women through endorsements and personal branding initiatives, opportunities that further widen the sports pay gap. Developing new norms through broader societal discourse and specific Women's Sports Marketing may offer a path toward solving these inequities.

### **How Does Religiosity Affect People's View on Abortion?**

Author: Trevor Hewins  
Major: Political Science  
Sponsor: Dr. Reilly

The research question was, as the title suggests, how does religiosity affect people's view on abortion? This was tested through the formation of hypotheses and a survey that was then distributed to as many people as possible. What was discovered was that the more one attends religious services, the more likely they are to hold pro-life viewpoints, yet this does not necessarily mean they believe religion should play a factor when it comes to drawing legislation.

### **The Role of Mental Illness Stigma in the Lives of College Students**

Author: Leigh Ann Hoskins  
Major: Social Work  
Sponsor: Reiko Ozaki

Stigma involves the negative or discriminatory attitudes that others have about mental illness. Past research suggests that mental illness stigma has a negative impact on the lives of college students in the United States. The study will analyze what college students believe about individuals with mental illness. Data will be collected online using a Qualtrics survey that will be sent out via social media. It is expected to find that mental illness stigma is prevalent among college students. Findings could be used to create educational programs that challenge stigmatizing beliefs.

**Leadership Characteristics and Coronavirus Rates**

Author: Faith Howard

Major: Political Science

Sponsor: Shauna Reilly

This paper examines the characteristics commonly associated with and analyzed regarding leadership in times of crisis, such as the COVID-19 pandemic. Reviewing the qualities and features typically associated with leadership allows social scientists to study what factors help influence an individual's perceptions of their leaders' actions as crises initially unfold, play out, and ultimately conclude. According to recent literature, variables such as a leader's gender, race, and partisanship should significantly impact a leader's course of action and effectiveness when managing a public health crisis. However, when it came to the early stages of the COVID-19 pandemic in the U.S., our study found that these variables made little to no difference in limiting the number of coronavirus cases on a state-by-state basis, disproving what previous literature would have suggested. When it came to analyzing the data regarding individuals in positions of power such as a state's governor, state house leader, senate leader, and health officer, the results displayed that there was almost no correlation between the individual's gender and race that resulted in a lower number of coronavirus cases and deaths within their states. Therefore, this study disproves previous literature, data, and analysis regarding the impact and importance of the role of leadership.

**Analysis of COVID-19 Vaccine Brand Sentiment on Twitter**

Author: Shawn Huesman

Major: Computer Science

Sponsor: Alina Campan and Traian Truta

During March and April, 2021, we collected tweets that contain both a COVID keyword and a vaccine keyword, using the Twitter free streaming API. In this work we focus on analyzing the tweets collected during the week, April 1 – April 7. Each tweet was placed in one or more subsets of tweets based on particular vaccine brand keyword that it contains. Using this approach, we created eight tweet subsets (non-disjoint) for the following COVID vaccines: 'Johnson and Johnson', 'AstraZeneca', 'Pfizer', 'Moderna', 'Novavax', 'Sputnik', 'Sinovac', and 'Covaxin'. For each subset, we computed the number of tweets per unit of time and the average sentiment score of the tweets during that time window, using a publicly available lexicon-based technique (TextBlob). We visualize both the count and average sentiment values for all 8 vaccine types.

### **Insomnia and stress**

Author: Anna Huff

Major: Social Work

Sponsor: Megan Lindsay

With so many people dealing with stressful, and so many people having a hard time sleeping. No one has ever looked into the correlation between the two. The purpose of this study and use of this one-time online self-administered survey to find out, if there is a correlation. I believe that I can find a direct correlation to those who are stressed also have insomnia symptoms. With over 200 woman taking the survey from different backgrounds, and economic status, it paint a very vivid picture of the effect stress takes on the sleep patterns of those who experience it.

### **Coping mechanisms used by college students struggling with anxiety**

Author: Monshare Hughes

Major: Social Work

Sponsor: Caroline Macke

Anxiety is a common mental health concern that affects all races and genders. Research suggests that everyday behaviors used to cope with anxiety can reinforce maladaptive functioning. The purpose of this study is to examine the common behaviors college students use to cope with their anxiety. This exploratory, cross-sectional study uses non-probability sampling and a self-administered, electronic survey. The results from this study are expected to show that college students often use maladaptive coping strategies when faced with anxiety provoking situations. Findings of this study may highlight the need for further intervention and psychoeducation as it relates to coping behaviors.

### **Impacts of Intimate Partner Violence on Academic Success**

Author: Tara Irvin

Major: Social Work

Sponsor: Jessica Averitt Taylor

Intimate partner violence (IPV) is a global social problem that impacts several areas of functioning including mental health, finances, education, and human development. This cross-sectional, self-administered survey will examine how IPV impacts the lives of individuals. The results will evidence the high prevalence of IPV, and illustrate the need for social work practice interventions designed to positively counteract associated negative economic and educational impacts. In addition, the results will support further research to identify specific challenges and possible policy and advocacy avenues to alleviate the impact of IPV.



### **Employee Retention in Healthcare**

Author: Joshua Isabell

Major: Integrative Studies

Sponsor: Rhonda Davis

The purpose of this research will be to educate the reader on why employee retention is important to invest time and money in. This will be done by providing insights from my relevant disciplines of Respiratory Care and Organizational Leadership. This paper will not be a single solution plan and in no way can this complex problem be solved by one solution. However, this paper will shed light on the importance of employee retention and the staggering statistics of why this topic should be looked into and broken down in an attempt to mitigate employee loss.

### **Mental Health in America: Misdiagnosis of ADHD in Young Children**

Author: Azariyah Israel

Major: Integrative Studies

Sponsor: Rhonda Davis

The issue I'd like to address is the over medication of children and adults I see in our society today, by starting with answering the question of misdiagnosis of ADHD in young children. I'm interested in this issue because it affects so many of us around the world in 2016 alone there were 2.4 million children diagnosed with ADHD from ages 6-11 in the US alone. I began my research by selecting two academic disciplines that are at the forefront of the diagnostic process. I continued by choosing a discipline that would provide the best solutions. The answer was to promote change in the evaluation process by focussing on policy and laws. If we can change the length of the evaluation and make it more intimate we can decrease misdiagnosis and potentially avoid over-medicating our youth. The future implications would be seeing adults that are capable of coping without medication and removing the dilemma we have in front of us today.

### **Understanding Drug Addiction in the United States**

Author: Kania Johnson

Major: Integrative studies

Sponsor: Rhonda Davis

The number of individuals effected by drug addiction is increasing each year. Addiction can come in many ways whether it be Alcohol, narcotics, or opioids, people fall victim every day Many people are perplexed as to why or how some become addicted to drugs. They may falsely believe that drug users lack moral values or motivation, and that they should simply choose to avoid using drugs. This presentation will inform you on what drug addiction is and how these individuals get treated. It will also explain opioid abuse and discuss interdisciplinary perspectives from different social sciences and explain how each discipline can contribute to this individual. Also provide an understanding that there is lack of treatment these individuals face daily.

### **Stop the Increase: Child Exploitation in Northern Kentucky**

Author: Kristin Johnson

Major: Social Work

Sponsor: Megan Lindsey

Identifying youth at risk or victims of Commercial Sexual Exploitation of Children (CSEC) can be difficult. Research shows that the earlier high-risk youth can be identified, offered services, and rapport built with investigators, the easier it can be to protect them from further exploitation. This research will analyze de-identified data from a local organization regarding cases identified as child exploitation. Results will assist this local organization in developing further training and programming for their clients, families of clients, and multidisciplinary team members.

### **Barriers of Retention in Child Welfare**

Author: Whitney Johnson

Major: Social Work

Sponsor: Megan Lindsey

Child welfare workers cover a large sector in the social work field, but it has very high turnover affecting vulnerable populations, costing the state money, and new social workers avoiding the welfare sector. The purpose of this study is to identify barriers child welfare workers encounter that cause them to leave that sector. Methodology: IRB-approved study from a qualitative approach via self-report survey based on the ProQOL-5 survey tool. Participants gathered via convenience sampling from one KY child welfare agency; employed between 2015-2021. The results will help identify and promote change so retention improves thus helping the vulnerable populations.

### **Mental Illness Among College Students**

Author: Sarah Johnston

Major: Social Work

Sponsor: Caroline Macke

Research shows that mental illness has been increasing among college students. Universities have responded to this social problem by expanding student resources, including counseling and disability services. This study seeks to examine if accessing disability services has a positive effect on the academic performance of students who have a diagnosed mental illness. The results of the study, which used an electronic survey, are expected to show that students who have a mental illness and utilize disability services perform at higher academic levels. These findings may prompt universities to encourage students to utilize disability services in order to promote academic success.

**Women's Sexuality in Popular Music from the 1980s vs Contemporary Pop Music**

Author: Brittany Jolly

Major: Theatre

Sponsor: Yasue Kuwahara

Research has shown that the sexualization of women has and continues to be a part of popular music media. For my approach, I focused on music videos from pop music in the 1980s and compared them to contemporary pop music videos, specifically comparing the sexuality of women found in both. My results were exactly as I had found in my research which is that women are still being sexually exploited in popular music, even more so now than in the 80s. I then contemplate my thoughts and feelings and if I think that this is damaging/exploitive or empowering.

**A Comparison of Tropinone Derivative Synthesis Protocols in an Undergraduate Research Chemistry Course Laboratory**

Author: Eric Jump

Major: Biochemistry

Sponsor: Lili Ma

Heterocyclic compounds are ideal candidates for pharmaceutical compounds. They are used as mediums in the synthesis of anticancer medicines. I80-H37 is one such possible molecule created by direct heteroarylation via Palladium catalyst. I80-H37 is a heterocyclic compound featuring a tropinone scaffold with a single nitrogen group. Physiochemical properties were analyzed using Molinspiration and Percepta software to determine the compound's active drug potential. This study compares different methods for synthesizing I80-H37 to increase production efficiency and the potential efficacy of I80-H37 as a vehicle for anticancer drug delivery.

**Substance Use Disorder and Treatment**

Author: Hannah Kandrack

Major: Social Work

Sponsor: Caroline Macke

Medically Assisted Treatment (MAT) can be a lifesaving tool for those who suffer from Substance Use Disorder, yet research suggests that there is considerable stigma associated with MAT. This cross-sectional study will use an electronic survey to examine people's knowledge and support of MAT. The expected results will show that individuals have limited knowledge of MAT and that there is also limited support for the use of this treatment option. Social workers may use these findings to raise awareness about this effective treatment strategy.

**The Implications of Poverty on Educational Achievements of College Students**

Author: Jamin Kennedy

Major: Social Work

Sponsor: Reiko Ozaki

Past research indicates that individuals who have experienced poverty tend to experience negative outcomes in issues related to education, physical and mental health, and incarceration. This study examines the relationship between poverty and educational achievements of college students. Data was collected utilizing Qualtrics, an online survey, administered to college students on social media. Educational achievements are expected to be lower for those who experienced poverty. Findings may assist in efforts including policy change, further research, and resources directed towards social justice initiatives for college students who have experienced poverty.

**Factors that Contribute to the Effectiveness of Substance Abuse Treatment for Women**

Author: Roxana Kennedy

Major: Social Work

Sponsor: Megan Lindsay

Substance abuse is considered to be a public health crisis with 53 million Americans reporting usage of illegal substances in the past year. 17% of that population are women, who represent the fastest growing segment of the substance abuse population. Additionally, recidivism rates among women who complete a substance abuse treatment program are high, especially within the first year. This research was conducted via an online survey given to 26 women who self-identified as being in recovery and they were asked about the role of social support, personal empowerment and access to resources in maintaining sobriety. It was found that these women held social support and personal empowerment to be key factors in aiding their recovery. This implies that substance use treatment should include continued opportunities to increase social support and resiliency.

**Disproportionate Representation and Fair Congressional Maps**

Author: Chris Kirkwood

Major: Political Science and Sociology

Sponsor: Shauna Reilly

Creating fair Congressional maps has proved a difficult task, despite various movements in favor of such, and popular support. Part of the issue is determining what constitutes a fair Congressional map. Considerations of determining what this fairness consists of includes "fair" mapmaking processes that have notable flaws, and judicially mandated remedial Congressional maps as a result of various perceived failings of the predecessor maps. Creating fair Congressional districts relies on several principles, and too narrow of a focus in any one principle can result in an unrepresentative map.

**An Analysis of Food Insecurity and It's Impacts on Higher Education**

Author: William Kirschner

Major: Social Work

Sponsor: Jessica Taylor and Megan Lindsay

Food insecurity in higher education is one of the many issues that have been exacerbated by the COVID-19 pandemic. This study paints a regional picture of food insecurity at a variety of institutions of differing sizes and educational levels. This mixed methods study consists of a survey for students and interviews of college food pantry staff. The results identify areas of need at institutions, as well as, highlight best practices that these pantries currently share. This information can help institutions in either scaling or starting new food pantries to serve their students.

**Telehealth Psychotherapy and Therapeutic Alliance**

Author: Stephanie Kising

Major: Social Work

Sponsor: Megan Lindsey

Telehealth has become increasingly utilized in efforts to adhere to social distancing during the COVID-19 pandemic. Clinicians' use of telehealth platforms to provide behavioral health psychotherapy has increased over the past years. Evidence suggests the use of telehealth mediums to provide therapy does not adversely affect the quality of the therapeutic relationship between therapists and clients. A survey was provided to Social Workers in Cincinnati to explore clinicians' perceptions regarding whether providing telehealth services affects the quality of the therapeutic relationship. This study will provide valuable information as the use of telehealth mediums to provide therapy continues to increase.

**Recruiting Geographically Diverse Respondents on a Budget**

Author: Jonah Krebs and Zach Beal

Major: Business

Sponsor: Joe Cobbs

Intergroup conflict has profound effects on society and individuals. The Know Rivalry Project is an intercollegiate research collaboration dedicated to sustainable production, discernment, and dissemination of knowledge about rivalry. To better understand the various antecedents and consequences of rivalries, we developed an online survey, tested it, and fielded it to recruited fans (our respondent sample) of both domestic and foreign sports. Doing so required a systematic process of joining communities, starting authentic conversations, and sharing survey access. In the future, responses will be cleaned and analyzed to refine our cross-sectional understanding of rivalry and how it affects various cultures.

## **Synthesis of Heteroaryl Compounds Through Palladium Catalysis for Pharmaceutical Developments in a Course-based Undergraduate Research Experience**

Author: Kaylee Kuennen and Angela Kyntchev

Major: Biology

Sponsor: Lili Ma

At Northern Kentucky University, under the Undergraduate Research in Organic Chemistry Course (UROCC) curriculum and with the use of Course-based Undergraduate Research Experiences (CURE) labs, students are able to understand and experiment with the synthesis of heteroaryl compounds in a palladium catalyzed reaction for potential medicinal uses. The chemical techniques used in this lab include microwave reactor, medium pressure liquid chromatography (MPLC), nuclear magnetic resonance (NMR), infrared (IR), and the related digital tools. Our study provided some preliminary results for the initial stage of drug discovery for pharmaceuticals against breast cancer.

## **How does Parental Drug Addiction Impact Children**

Author: Katelyn Kuntz

Major: Social Work

Sponsor: Caroline Macke

Addiction is a growing problem around the world, especially in our community. This problem may be growing because of the addiction being passed down from parents to their children. The purpose of this study is to examine whether a parent's addiction increases the likelihood of their child developing a substance use disorder later in life. A brief, electronic survey was used for data collection. The results are expected to show a relationship between parental addiction and their children developing a substance use disorder. These findings can assist social workers in advocating for preventative measures for children of people with addictions.

## **Fact and Fiction: News in the Age of Social Media**

Author: Amanda Lakatos

Major: Integrative Studies

Sponsor: Steven Watkins

As social media becomes more prominent in today's society, many Americans turn to platforms like Facebook and Twitter as sources of news. Unfortunately, the platforms often employ algorithms that make it easy for echo chambers to form, cutting off users from one or more sides of political arguments or competing points of view on news stories. Furthermore, misinformation in the form of untrustworthy news sources or user commentary can spread rapidly on these platforms. This report seeks to understand this problem of social media as a news source and identify an interdisciplinary solution to the problem. It analyzes research in the fields of digital communication and psychology to understand the problem. It also finds an interdisciplinary solution by integrating those disciplines with education, suggesting a public information campaign to make social media users aware of selective exposure, social media algorithms, and how to identify credible news sources. Finally, it discusses how this campaign can expand into the school curriculum.

**Public Opinion of the US Supreme Court**

Author: Kurt Lange

Major: Political Science

Sponsor: Professor Reilly

The following presentation looks at perceived opinion of the Supreme Court by college student athletes. The study supported that the Supreme Court was the most supportive of the three branches of government. It also identified biases that exist in the perception of the court with and equal an opposite political biases existing. It also illustrates that issues such as race, religion and gender did not play a pertinent role in ones support of the Supreme Court.

**Unemployment Benefits: The Need for a Strong Federal System**

Author: Alex Lapin

Major: Integrative Studies

Sponsor: Steven Watkins

There are major problems within our state-run unemployment programs, and this was showcased by the COVID-19 pandemic when these programs were overrun with claims and disgruntled users. The problem stems from every state having a different program with different criteria with varying amounts of aid. This capstone aims to argue for a federal unemployment benefits system where every American receives a proportionate amount of aid nationwide. This argument is supported by a comparison between two states' programs, research into how ineffective state governments are during an economic recession, and the huge role the federal government had in bailing out the state programs during the pandemic.

**Identification of Trm7 residues required for Trm734 binding for tRNA methyltransferase activity in yeast**

Author: Thao Linh (Rosie) Le, Morgan E. Fraley, Linh Le, Alex K. Mullins, Holly M. Funk, Bereket T. Bekele, Adrian R. Guy, and Michael P. Guy

Major: Chemistry

Sponsor: Michael Guy

Post-transcriptional modifications are made on tRNA, an important molecule for the synthesis of proteins, that allow for functional proteins and cell growth. The enzymes that are involved in the modification process are still being identified in higher eukaryotes, including humans. In yeast, it has been shown that Trm7 forms a complex with Trm732 and Trm734 to modify tRNA at positions 32 and 34, respectively. In humans, the lack of Trm7 causes intellectual disability. The crystal structure of the Trm7-Trm734 complex has been solved, however, the Trm7 residues that are important for the interaction for these proteins are still being investigated. We have identified Trm7 Y138 as important for binding to Trm734 using site-directed mutagenesis and a spot test assay. We are now testing another 10 residues that are predicted to be important for binding based on the crystal structure. Understanding this interaction can be used to identify Trm7 residues important for the Trm7-Trm732 interaction, whose structure has yet to be solved.

**Acetone Centrifugation and Acid/Base Work Up for Palladium-catalyzed Heteroarylation of Ketones Reaction**

Author: Thao Linh (Rosie) Le and Binh Nguyen

Major: Chemistry

Sponsor: Lili Ma

The research belongs to the CURE program which exposes students to research. 2.5 million women in the US are currently fighting against breast cancer. Fortunately, placental aromatase cytochrome exists an active site that is potential for interacting with drug inhibitors. Tropinone derivatives (I80-H40, I80-H44, and I80-HIH45) were synthesized using the microwave to yield H-bonding and interaction with the Heme group in aromatase. The reaction is catalyzed by Palladium catalysis to prevent (bishero)arylation. During the process, a new work up method by acetone and acid/base wash was found to yield a better purification of the product.

**Discrimination and Its Emotional Impact**

Author: Clare Lees

Major: Social Work

Sponsor: Caroline Macke

Discrimination is a pressing topic that has received a lot of attention within the past few years. Research suggests that acts of discrimination can negatively affect all facets of a person's life, including their physical, mental, behavioral, and academic wellbeing. This cross-sectional study uses an electronic survey to examine the prevalence of discrimination, the race of the person engaging in the discriminatory behavior, and whether the race of the perpetrator influences the extent of the emotional toll that results from said discrimination. The findings from this study will help us to better understand this social problem and the resulting consequences.

**Substance Use and the Impact on Family Relationships**

Author: Jenna Leisure

Major: Social Work

Sponsor: Caroline Macke

The literature suggests that drug use has increased significantly over the past few years. Furthermore, drug use can negatively affect a person's academic, physical, and mental wellbeing, as well as their family relationships. This cross-sectional study, which utilizes an electronic survey, will examine the relationship between the frequency of drug use and the quality of family relationships. The findings are expected to show that drug use is associated with less positive familial relationships. These findings will help social workers advocate for substance use programming and improved social supports for individuals suffering from substance use disorders.



### **The Circle is Unbroken: Fighting Stereotypes and Preserving Appalachian Culture**

Author: Andrea Lewis

Major: History

Sponsor: Rebecca Bailey

Settlers from Western Europe arrived in the Appalachian Mountains in the early 1700s bringing their way of life and ancient word with them. The barrier of those mountains created a culture unique to Appalachia, which has been matched with judgement from outsiders. In this project, I have highlighted Ms. Octavia Sexton's life as a storyteller and the importance of oral tradition in Appalachia. I want to continue my work on this project to highlight culture in Appalachia, focusing on views from minority groups to show the diversity and unique culture that is rooted in the rich soil of the mountains.

### **The School-to-Prison Pipeline**

Author: Chasitee Little

Major: Social Work

Sponsor: Caroline Macke

Systemic racism in education has led to black students disproportionately being referred to the juvenile justice system due to relatively minor school-related behavior issues (truancy, disruptive behavior, etc.). The purpose of this study is to examine the relationship between racial bias in punitive actions imposed by school systems and academic achievement outcomes. Results from an electronic survey are expected to show disproportionate involvement of African American students in the juvenile justice system being linked to those students having poor academic performance and career outlook. This research will highlight the effects of racial bias in education.

### **Abusive Leadership Among Coaches**

Author: Bryson Lonsbury

Major: Organizational Leadership

Sponsor: Megan Downing

Famous athletic coaches Vince Lombardi and John Wooden exemplify authentic leadership practices, a leadership approach that has been recognized as the most effective leadership approach in athletics. Unfortunately, not all coaches follow those tenets of leadership. This study explores abusive leadership practices that are all too often leveraged by coaches and discusses what can be done to reduce abusive leadership in the world of sports. Using a literature review methodology, journal articles were reviewed to draw conclusions about abusive leadership approaches among athletic coaches.

### **How does substance abuse education affect Black Women's substance use in College**

Author: Alexandra Lubans-Jones

Major: Social Work

Sponsor: Dr. Reiko Ozaki

This is a social problem that effects everyone either directly or indirectly. It is a cause that needs a lot of constant attention due to the overwhelming amount of adults and children affected by either alcohol or substance misuse. This is a disease that we can use prevention to educate in schools, churches, and community partners. Literature shows us that there is a delay in services and limited research for the non-white people who are diagnosed with substance use disorder. The lack and delay in healthcare, preventative, and educational resources, result in Black women to have a higher rate of medical issues, such as cirrhosis, respiratory complications.

### **Public Opinion of Congress**

Author: Dylan Lykins

Major: Political Science

Sponsor: Shauna Reilly

This project was conducted to explain how citizens view their legislative branch. The research included a 20 question survey administered to 40 respondents and primarily interviewed individuals in the Milford, Ohio and Williamsburg area. The answer is that public opinion is formed in a variety of ways and Congress scores consistently low in the eyes of the public. This also highlights the reasons why and how to improve our political system.

### **Music and Anxiety**

Author: Keely Lyons

Major: Social Work

Sponsor: Megan Lindsey

Past research has looked at different ways to decrease anxiety. One study showed a decrease in anxiety for parents that colored while their child underwent surgery (Robinson, Baker, & Hossain). I wanted to see how anxiety would be affected by music. I created a survey that assessed the participants level of anxiety. I then asked the participants what type of music they listened to and how often they listened to music. The result of the study could give information on how music effects anxiety.

**Identifying Random Samples of TikTok Users**

Author: Jillian Maher Logan Brown and Desmond White  
Major: Education and Computer Science  
Sponsor: Traian Marius Truta

As the TikTok social media platform rapidly grows in popularity, the question was asked on how to obtain a random sample of TikTok users indicative of the general population of users. This research tests two different methods for obtaining a random sample of users. An analysis determined the uniqueness of the samples retrieved using a comparison of the fan counts for each user obtained. The first method utilizes usernames as seeds for producing suggested users while the second method retrieves a common datapoint, such as a hashtag, and locates users of the common datapoint. The findings revealed that suggested user crawlers, when starting with trending TikTok usernames, only revealed users with fan counts in the millions. Even iterating the suggested user list as the new seeds maintained a nearly unchanged list of users in later iterations. The hashtag discovery method revealed a diverse range of users from single digit fan counts and up to millions of fans. It was determined that, based on the diversity of fan counts achieved, the discovering hashtag method is the best method for obtaining a random sample of users.

**College Students with Criminal Backgrounds: What Do Peers Think?**

Author: Tina Malone  
Major: Social Work  
Sponsor: Reiko Ozaki

The perceptions of individuals with criminal backgrounds may lead to an unfair judgement from their peers or even employers. These perceptions can hold someone back who may have committed a crime in their young age that may ultimately follow them for the rest of their adult life. The questions in this study are to determine how their own peers see them and how they think that perceptions will affect the lives of an student with a criminal record. Do they think the student with a criminal record will have the same opportunities as they do after college?

**COVID-19 and the impact on mental health**

Author: Sarah Martin  
Major: Social Work  
Sponsor: Caroline Macke

The COVID-19 pandemic has taken a toll on people's mental health. Specifically, literature demonstrates that COVID-19 has negatively impacted parents, first responders, law enforcement, and healthcare workers. Literature on the mental health ramifications of COVID-19 among the general public is largely missing. This exploratory, cross-sectional study will collect data from an estimated 200 individuals to examine the mental health implications of COVID-19 among the general public. The findings will show that COVID-19 has negative mental health implications. These results will allow me to educate others on the pandemic's impact on mental well being and how we can promote mental health.

### **COVID-19 and Social Isolation in Older Adults**

Author: Sarah Martin

Major: Social Work

Sponsor: Suk-hee Kim

COVID-19 has shaken the world to its core and has had a profound impact on the physical health of older adults. The unrelenting pandemic has also seen a surge of loneliness and social isolation for the gerontology population. This study seeks to address the implications of COVID-19 and social isolation for older adults. The current literature showed that older adults are significantly impacted at an increased rate for physical and mental health complications. Findings show that statistically older adults are impacted at a higher level than other age groups, which is why awareness and advocating for this age group is so crucial to the improvement of their well being. COVID-19 and social isolation have taken a negative toll on the bio-psycho-social aspects of older adults and future research needs to focus on awareness, advocating, focusing on the long-term mental and physical health implications for older adults as well as their family members and the impact it has had on them.

### **Financial consulting firm**

Author: Lionnelle Mashini

Major: Finance

Sponsor: Jeffrey Varrone

Last semester, in my independent class, Entrepreneurship 490, I developed my company which is a Financing consulting firm. For a long time, I had a desire of helping people with their finances. That desire was rekindled, questioned, and challenged by my professor, professor Varrone who led me into thinking creatively and critically. I have found out that about 50% of Americans cannot afford a \$1,000 emergency bills. 78% of Americans live paycheck by paycheck. 23% of Americans still owe \$5,000 of past emergency bills. This is the reason, I came up with the idea of creating a company that will help people to resolve their misconceptions about money and how to handle it properly.

### **Mental Health Prevention Programs: Are There Differences in Outcome Measures between In-Person and Online Presentations?**

Author: Kirsten Matala

Major: Social Work

Sponsor: Megan Lindsey

As a result of the COVID-19 pandemic, many aspects of our lives have moved to virtual platforms. National Alliance on Mental Illness (NAMI) Southwest Ohio's mental health prevention services were among those transitioned to virtual platforms. The purpose of this study is to examine if there is a difference between in person and virtual prevention programs. Data in this research was collected by NAMI Southwest Ohio and will be utilized to examine the differences in mental illness stigma and perceived quality of the presentations. This research will add to our knowledge on differences in virtual and in person programs.

### **Party Identification and Polarized Perceptions of Corruption**

Author: Dylan McDaniel  
Major: Political Science  
Sponsor: Shauna Reilly

Polling and research have often focused on partisan differences on substantive policy measures, and also on general negative evaluations Americans hold of government. But what about potential partisan differences when it comes to these negative evaluations? What role could party strength play? Literature finds substantial out-group negativity biases as well as in-group favoritism, declining trust in government, and differences of government satisfaction between political majorities and minorities. Here it is found that American partisans actively demonstrate differences in their evaluations of Congress: Democrats, the political majority, are less likely to perceive corruption in Congress; However, partisans both negatively rated the opposing party as more corrupt, reinforcing research on out-group biases. In this study, results demonstrate that American partisans actively demonstrate differences in their evaluation of Congress, particularly in their perception of the other party as corrupt, reinforcing research on out-group biases.

### **Veteran Student Success**

Author: Donald McGlothin  
Major: Social Work  
Sponsor: Jessica Taylor

Currently NKU is below average at graduating students due to lower retention rates. Lower retention effects both students and NKU. The perceptions of students and Veteran students may offer insight or solutions. A survey consisting of categorical questions will be distributed via social media. This survey addresses students' and military veteran students' perceptions of facilitators and barriers to success at NKU or other institutions. Common perceptions are anticipated regarding cost and course offerings. Once data is collected common perceptions, positive or negative, may provide insight improving retention and Veteran success at NKU.

### **The Impact of Police Brutality Video Footage on Mental Health**

Author: Marcus McNeil  
Major: Social Work  
Sponsor: Caroline Macke

Due to the rise of social media, it has become easier to access video footage of police brutality. Despite not being directly involved, viewers of these videos are at risk of long-lasting traumatic effects. By means of an electronic survey, which will be distributed through social media, this cross-sectional study will examine the mental health and secondary traumatic consequences experienced by those who watch video footage of incidents of police brutality. The findings from this survey may inform mental health professionals who are developing tools and resources for individuals who have been impacted by this form of secondary trauma.

## **Student and Faculty Appraisals of Course-Based Undergraduate Research (CURE)**

### **Chemistry Courses**

Author: James Mead

Major: Biology

Sponsor: Lili Ma

Engaging students in undergraduate chemistry laboratories is vital in preparing students for careers in research. Course-based undergraduate research experiences (CURE) aim to integrate a unique research opportunity into the curriculum to increase student success. Current research shows students report increased preparedness and satisfaction from CURE-based labs as opposed to standard undergraduate chemistry labs, with results of CURE labs benefitting the scientific community through new information on drug entities and catalysts. Our CURE lab involved 12 students and three teacher's assistants performing a palladium catalyzed heteroarylation involving tropinone, with this reaction chosen because of its difficulty and feasibility for undergraduate students.

## **The Impact of the COVID-19 Pandemic and Social Justice Involvement on Sorority and Fraternity Leadership**

Author: Haley Midkiff

Major: Neuroscience

Sponsor: Christine Curran

College students in the past year have been affected by two major social-stressors; the COVID-19 Pandemic and the widespread Black Lives Matters protests. Our focus for this study was all public, four-year universities in Kentucky and we used a Qualtrics survey based on multiple validated instruments of stress and student leadership to determine how sorority and fraternity leaders were affected over the last year. Preliminary analyses emphasize the importance of demonstrating empathy and increased stress from individuals concerning their future. Future work in this area can increase success in student leadership as our society changes and adapts to new stressors.

## **College Students' Experiences of Racism on Campus**

Author: Rachael Miller

Major: Social Work

Sponsor: Reiko Ozaki

Studies indicate that experiences of racism on college campuses can have dramatic effects on academic success in minorities. While societal perceptions reflect that such experiences have steadily declined over several decades, studies indicate that such experiences are still prevalent. This study seeks to identify the instances of racism experienced by college students. An online Qualtrics survey was self-administered via social media. Experiences reported by college students are expected to indicate higher incidences of racism on campus than socially suggested. Findings may be used to demonstrate potential needs for systematic change in higher education in order to foster educational success.

## **Domestic Violence**

Author: Mackenzi Minton

Major: Social Work

Sponsor: Megan Lindsey

Domestic violence is a large social problem in our world. Children are often witnesses of domestic violence (DV). Research shows children exposed to DV experience negative impacts on future adult relationships. The purpose of this study is to examine what extent witnessing DV as a child impacts relationship as an adult. Information obtained from this research will potentially be used to inform social work practice and community partners.

## **Non-traditional learning is it the way to teach the future?**

Author: Alecia Mize

Major: Interdisciplinary Studies

Sponsor: Rhonda Davis

The students of today will be our leaders of tomorrow. This is why I believe that every child should have a quality education no matter what school they attend. Non-traditional teaching is it the way to teach the future? This is my interdisciplinary research topic. I chose this topic because I wanted to incorporate two things that I really enjoy and love to do which is teaching and being outside. As a parent and a member of my community I really want my child and others in my community to receive the best education that they can.

## **Phenylethyloxacalixarene Synthesis Via TBS-Protected Phenylethynylcatechols**

Author: Luis Montes, Stephanie Saner, Thao Tran, Bailey Hardy, and Bailey Kimme

Major: Biology

Sponsor: KC Russell

The purpose of this work is to develop a method to synthesize annulene-o,m,o,m-oxacalix[4]arene hybrids. These molecules are expected to adopt a conformation where the annulenes are in a close, cofacial orientation, resembling a tweezer. Once prepared, these hybrids will provide insights into the interactions between cofacial aromatic and antiaromatic systems. To develop the methodology for the synthesis of these annulene-oxacalixarene hybrids, a series of p-substituted phenylethynyl-o,m,o,m-oxacalix[4]arenes is being prepared. The substituents range from strongly electron withdrawing to strongly electron donating, allowing a systematic study of the electronic nature of the phenylethyloxacalixarenes and providing experience on how to synthesize and purify annulene compounds. This poster will discuss our progress in the preparation of the phenylethyloxacalixarene series.

**The Importance of a Quality Physical Education Program**

Author: Austin Neff

Major: Integrated Studies

Sponsor: Steven Mark Watkins

This paper focuses on the Importance of a Quality Physical Education program in regards to the obesity crisis in America. One of the ways to tackle this problem is to maximize the time that children spend in school. By focusing on the school day and implementing Physical Education as a class, as well as daily recess, students benefits in a multiple ways. Being physically active boosts cognitive development and increases attention spans. The benefits not only relate to medical issues, but also to psychological social problems. In recent years, Kentucky has been required to implement School Wellness Policies. This holds schools more accountable and requires them to report assessment results and mandatory minutes.

**The Political Philosophy of Robert A. Heinlein**

Author: Phillip Neidhardt

Major: Political Science

Sponsor: Jonathan McKenzie

Robert A Heinlein was one of the bestselling American science fiction writers in history. Before his death in 1988, he published thirty-two complete novels and over fifty short stories. Heinlein's work was filled with his own unique ideas of topics from race and religion to sex and gender, but no topic was more prevalent in his works than politics. As a bestselling author with more than 30 million books sold, and whose work was recognized by the Library of Congress as culturally important, it is important that we understand the unique political ideas of Robert A. Heinlein.

This project is an exploration of Heinlein's political ideas and ultimate political philosophy as seen through his four Hugo award winning novels: Double Star, Starship Troopers, Stranger in a Strange Land, and The Moon is a Harsh Mistress. Utilizing the political content of these novels, in particular, the views of the state expressed in each, this project attempts to place Heinlein on a traditional political spectrum and to evaluate the political messages of his works that have been so popular for over eighty years of publication.

**Modeling Carter Caves: Structure-from-Motion Photogrammetry**

Author: MacKenzie Nelson

Major: Geology

Sponsor: Sarah Johnson

Researchers and explorers alike have experienced the limitations of cave mapping due to the fact that one cannot see much of the whole cave system from any single vantage point, making accurate surveying difficult and tedious, and because the variety of passage shapes and cave features are difficult to adequately portray using traditional survey techniques. This project aims to remove some of these limitations using the photogrammetric technique Structure-from-Motion (SfM) which uses sets of overlapping photos taken at multiple vantage points to create an accurate 3-dimensional model of the cave. High resolution imagery is then draped onto the model so as to give the viewer a virtual cave tour. The accuracy of this photogrammetric method as a viable stand-alone technique for cave mapping was tested at X-Cave at Carter Caves State Resort Park in Kentucky. Survey markers were placed throughout the cave system, and the distances between markers measured in the field using a disto-laser distance measuring tool. The SfM program Agisoft Metashape was used to process over 6,000 photos, and a 3-dimensional model of the cave was constructed which included the markers in the imagery. Marker distances within the model were then compared with surveyed marker distances to assess the accuracy of the model. The use of photogrammetry can reduce limitations to traditional cave mapping and provide not only an accurate map, but a more realistic and detailed cave map.



**Religious Commitment Correlates with COVID-19 Guideline Compliance in Association with Self-Efficacy**

Author: Kennedy Neltner

Major: Psychology

Sponsor: Allyson Graf

When COVID-19 appeared in the United States, religious holidays were approaching, causing those who celebrate to consider the importance of social distancing versus congregating. This sparked an early tension between religious commitment and prevention guidelines. Previous research in general and specific to past pandemics (e.g., H1N1, Cho & Lee, 2015; SARS, Zwart, 2009), show that there are mental and physical benefits to religion. Within this literature, religion has been correlated with self-efficacy (SE), improving perceptions of ones' capability to perform health tasks (Fry & Debats, 2009; Nie, 2019). Religion can create an internal motivation, such as believing that there is hope for ones' personal future, as well as external motivation by having support within a congregation of others who hold the same beliefs. This study analyzed the relationships between religious commitment, SE, and intention to social distance. We hypothesized that higher religious commitment would positively relate to SE, and in turn, positively to intention to social distance.

**Synthesis Reaction between Tropinone and Heteroaryl Compounds to Create Aromatase Inhibitors**

Author: Binh Nguyen

Major: Chemistry

Sponsor: Lii Ma

Heteroaryl compounds are one of the most valuable compounds that can be used to benefit the pharmaceutical industry. The reaction between heteroaryl compounds with tropinone will potentially create bioactive products - heteroaryl tropinone, which can help to make aromatase inhibitors. These inhibitors are then used to apply in the process of curing breast cancer. In our research, each individual was given certain heteroaryl compounds such as 4-bromo-1H indazole(H44), 6-bromoquinoline (H40), 5-iodo-1H-idazole (HIH45) to run the reaction using the microwave irradiation method. After that, the product went through the process of simple workup (acetone centrifuge), purification ( acid-base extraction, rotavap), and characterization (NMR). To identify the bioactive of the pure product, we utilized computer modeling to predict the inhibitor interaction. The successful molecule will be submitted for further analysis as contributing to the medication and education in the organic research field.

**Role of Teaching Assistants in NKU Organic Chemistry Course-Based Undergraduate Research Experience (CURE) Labs**

Author: Thu Nguyen, Kalyn Koons, and Motaz Marashdeh

Major: Chemistry

Sponsor: Lili Ma

In the traditional lab setting, many organic chemistry students find themselves following step-by-step instructions provided by the instructor and/or lab manual. This method does not allow the student to fully understand the underlying concepts or learn to problem solve in the lab. Course-Based Undergraduate Research Experiences (CURE) labs allow students to think critically about the science behind what they are doing, and problem solve along the way. However, running such a complex lab has proven too difficult for a single instructor, thus requiring the help of two teaching assistants to help with the utilization of important lab equipment as well as general lab procedures and protocols.

**Understanding the Crisis of School Bullying**

Author: Kayla Norton

Major: Integrative Studies

Sponsor: Rhonda Davis

Bullying is a highly prevalent impact on individuals every day with school environments being known to be the location for many instances of bullying among children. With nearly 160,000 children staying home every day due to the fear of being bullied, this is an obvious crisis which is supported by study within psychology, sociology and human resources. Research has found that intervention within schools can help curb bullying but even still this crisis proceeds. In my research, I investigate the characteristics of bullies and victims, the influences which shape these parties, and the methods that may help end bullying.

**Interesting Heteroaryl Compounds**

Author: Ashley Osborne

Major: Biology

Sponsor: Lili Ma

Course-based Undergraduate Research Experiences (CURE) at Northern Kentucky University has students collaborate utilizing interesting molecules that are involved in medicine. These heteroaryl molecules have been handled by professionals and hypothesized to be factors within cancer. While knowing this, the class is motivated to make a difference by trying hard to have successful reactions and data within the lab. Successful synthesized and purified compounds can be viable for further research. The differences in results among the molecules give us a better understanding and a chance to present our findings. The tools used in the class portrays the complexity of organic chemistry differently and realistically.

**The Five-Day Work Week - Who is This Working For?**

Author: Sarah Parlow

Major: Integrative Studies

Sponsor: Steven Watkins

Work-Life balance is a buzzword we hear a lot these days, but what does it actually look like for the average American? For many, it looks like a lack of balance. Rushing from work to pick up the kids, take them to practice or rehearsal, wishing you had enough time to cook a healthy meal but knowing it would mean getting to bed later and feeling exhausted the next day. By examining the current state of work-life balance in the US through an interdisciplinary perspective, while specifically paying attention to the outdated standard of the five-day workweek, it can be shown why we should look closer at this practice in our society. Improved balance between work and personal life through a four-day workweek could be beneficial for all stakeholders.

**Fight The System: The Art of Protest Music**

Author: Alysa Parr

Major: Public Relations

Sponsor: Zachary Wells

Popular culture is an aspect of life that we are exposed to daily whether it be a simple television program to the various world issues we face. Over many decades, there has been an overwhelming presence of these issues, allowing protest music to come to the forefront. The purpose of this study is to determine how these songs impact popular culture and social movements from the 60s, 70s, 80s, and modern-day. Furthermore, it explores what songs were inspired by each movement, their significance, and how they relate back to modern-day protest music.

**Mental Health Symptoms Among Student Athletes**

Author: Angela Parsons

Major: Social Work

Sponsor: Caroline Macke

The literature indicates that student athletes experience mental health symptoms at a higher prevalence when compared to students not participating in athletics. There is little research conducted on this prevalence among Northern Kentucky's regional students. This exploratory, cross-sectional study, which utilizes non-probability, purposive sampling, seeks to examine this prevalence. The results of this study are expected to show that regional student athletes are equally susceptible to the increased prevalence of mental health symptoms as those in other regions. The hopes of this study are to provide regional student athletes insight into their increased risks of developing mental illness.

**Assessing Adult Memory and Learning in Three Genotypes of Mice Exposed to Benzo[a]Pyrene During Early Brain Development**

Author: Shreyaben Patel, Katelyn Clough, Emma Foster, Kevin Berling, Amanda Honaker, Angela Kyntchev, Aria Towell, Connor Perry, Jayasree Mullaguru, Emma DeBurger, Kayla Jenkins, Victoria Ferguson, Tyler Forrest, and Diarra Niang

Major: Biological Sciences

Sponsor: Christine Curran

Benzo-[a]-pyrene (BaP) is a polycyclic aromatic hydrocarbon and a major component of traffic-related air pollution. It has been linked to learning and memory deficits. BaP binds to the aryl hydrocarbon receptor (AHR) and is metabolized by CYP1 enzymes. We look for genetic differences that affect susceptibility to early life BaP exposure using a mouse model and tests of learning and memory. BaP-treated *AhrbCyp1a2(-/-)* mice took significantly longer to find an escape platform in the Morris water maze. BaP-exposed mice also had significantly impaired reference memory in the maze probe trials and in the novel object test of visual recognition memory.

### **Balancing Friendship and Leadership**

Author: Molly Payne

Major: Organizational Leadership and Dance

Sponsor: Megan Downing

How to balance friendship and leadership. Who does not want to be liked by their peers? No one wants to be disliked. However, when workplace promotions elevate one co-worker to a position of authority over co-workers, the interpersonal dynamic changes and can create leadership challenges. This autoethnographic study offers an account of my personal experience with this workplace dynamic, explores the challenges of this transition, and offers insights into balancing responsibility across these two "ships" of leadership and friendship.

### **Using Artificial Intelligence Techniques to Generate Quizzes Tailored to the User**

Author: Cody Perdue

Major: Computer Science

Sponsor: Dr. Gary Newell

The goal of this capstone project is to use artificial intelligence techniques to generate quizzes tailored to the user. A chosen topic will contain a database filled with an abundance of questions and information relevant to each question. The user will be given a quiz on the topic, and the results of the quiz will be sent to an artificial intelligence engine. This engine will use different techniques to generate new quizzes that focus on certain aspects based on received data and targeted characteristics. The end results of this project should be endlessly generating quizzes that assist the user in learning efficiently.

### **Understanding How College Students Navigate Food Insecurity**

Author: Valentine Peterson

Major: Social Work

Sponsor: Reiko Ozaki

Food insecurity is a growing challenge for college students. While many students utilize food pantries, this is not the full story of how students navigate food insecurity. This exploratory study will be completed using an online survey distributed via social media. The survey will ask participants how they are able to feed themselves while being food insecure. The results of this study will grant insights into the various ways the current generation of college students adapt and overcome food insecurity, and help improve and adapt future practice.

**The Impact of Binge Drinking on Student Wellness**

Author: Brett Phillips

Major: Social Work

Sponsor: Jessica Averitt Taylor

Binge drinking amongst college aged students negatively impacts student wellness and increases risk for social problems. The purpose of this study is to evaluate how binge drinking negatively impacts wellness. The irresponsible consumption of alcohol can impede academic success and damage relationships. This exploratory, cross-sectional study will utilize non-probability, purposive sampling to collect data from an estimated 200 NKU students and other college-aged individuals. It is expected that the data will show a negative relationship between binge drinking and student wellness. This study will result in targeted policy initiatives and improved interventions for college students who engage in binge drinking.

**Breastfeeding Support: Measuring the level of comfort during and after delivery**

Author: Bridgitte Price

Major: Social Work

Sponsor: Megan Lindsey

Beginning research has been conducted to gauge the level of trauma-informed care shown by hospital staff related to breastfeeding mothers. A brief survey was administered to better understand the support given to mothers by hospital staff when deciding to breastfeed. These results will assist social workers in advocating for more trauma-informed approaches within the OBGYN practice to promote a healthier, more positive environment for the patient during and after delivery.

**Working from Home Mental Health Effects**

Author: Brooke Purcell

Major: Integrative Studies

Sponsor: Steve Watkins

Using the disciplines of business and social psychology I studied how the mental health of employees working from home due to the Covid-19 pandemic were affected. Through the research of academic journals and personal interviews I found that many employees were and still are being asked to complete daily work tasks from home with inadequate materials and resources. This on top of home life has had a sincerely negative impact on many employees, especially women. If more resources and adequate materials were provided to employees, it would lessen their stress and could improve their mental health.

**Impostor Phenomenon in the Football World**

Author: Tyler Reese

Major: Organizational Leadership

Sponsor: Megan Downing

Impostor Phenomenon or “IP” is when an individual has self-doubt and a fear of being considered fraudulent, although they have success in their field. Typically, IP research has looked at the effects of leaders in the workplace and their psychological tendencies. The purpose of this paper is to look at the effects of IP within coaches, specifically football. The goal is to create a conceptual foundation for how IP directly relates to coaches who operate in the cut throat business of sports and to bring further knowledge of IP and create a talking point of how IP affects the sports world. Furthermore, building possible solutions to the phenomenon that haunts many leaders in today's businesses. Using a scoping literature review methodology, this paper takes a deep look at self-efficacy in the coaching world to further understand IP and how it manifests. Also, the way other external factors like results and performance affect IP within coaches. The results of this study provide examples of how IP plays a role in the coaching experience, and the internal struggles IP creates. Suggestions for successfully mitigating IP in the coaching world are provided. Suggestions and solutions to how IP plays a role in coaches are provided. Self-efficacy is a major part in how coaches develop IP as well as multiple outside factors that result in coaches having more stress and an internal struggle with IP.

**Tropinone Synthesis with Heteroaryl Compounds to Create Aromatase Inhibitors**

Author: Danielle Rennekamp

Major: Biology

Sponsor: Lili Ma

The Course-Based Undergraduate Research Experiences at NKU allows students to utilize organic chemistry in laboratory settings by performing experiments, generating unseen data, and presenting results. The purpose of this experiment is to study heteroaryl compounds; they are valuable building blocks in medicinal chemistry and chemistry industry. A heterocyclic halide reacts with tropinone molecule with palladium catalyst under basic conditions to give our desired product for testing. The reaction undergoes microwave-irradiation, acid-base extraction and rotary evaporation to purify, and NMR to evaluate the product's structure. Heteroaryl compound reactions have much potential to be further explored as molecules used in cancer research.

**Awareness of Human Trafficking Among College Students**

Author: Sarah Reynolds

Major: Social Work

Sponsor: Rekio Ozaki

Past research suggest that an increased level of awareness of human trafficking in the general public leads to better outcomes for victims, advancement in policy, and higher levels of prevention . This study evaluates the level of awareness of the social issues of human trafficking among college students. Data were collected using an online survey created through Qualtrics. It is anticipated that the level of awareness of human trafficking will be relatively low among college students. Finding from this study can be used to raise levels of awareness, advocate for expansion of victim services, and promote policy change.

**Issues with Medical Health Insurance Coverage for Patients**

Author: Courtney Richardson

Major: Integrative Studies

Sponsor: Steven Watkins

The focus and reason for raising awareness of the different ways that medical and health insurance can affect the patient getting the correct care is part of the process to establish a good health insurance system that meets the needs of most people and bring current issues to the forefront of the problem of insurance companies being more concerned with the bottom line of the company's profits. There is no easy solution to this problem, but rather a diverse understanding of issues that need to be addressed for better healthcare in the future.

**Your Community Can Reduce Stigma Against Those Experiencing Chronic Homelessness**

Author: Emily Ricket

Major: Integrative Studies

Sponsor: Rhonda Davis

Small communities have the ability to help reduce stigma facing those who are experiencing chronic homelessness. My research statement is that small communities have this ability and the research conducted was done through finding credible sources and interviewing workers in a homeless shelter in Kentucky. This paper discusses what stigma is and the most common myths facing the chronically homeless population. After that, a small discussion of evidence-based solutions that have not been implemented by organized leadership is provided. Finally, there is an explanation on how small communities and individuals can make a difference, whether they believe so or not. I was able to conclude from my research that my original statement is true and that, oftentimes, people have more of an impact than they believe. The overall purpose of this study is to explain how stigma is harmful and what can be done in response to help fix this societal issue.

**Prevalence of Undergraduate Emotional Intelligence Instruction at Kentucky Public Universities**

Author: Carter Ross

Major: Organizational Leadership and Communication Studies

Sponsor: Megan Downing

Research demonstrates that emotional intelligence (EI) is a primary factor in leadership and administrative success as well as a key component to organizational success; thus, undergraduate education in EI is a necessary component of undergraduate education in these disciplines. To explore the prevalence of emotional intelligence instruction in undergraduate settings, this study reviewed college of business and leadership undergraduate program curriculum at seven public universities in Kentucky: University of Louisville, University of Kentucky, Northern Kentucky University, Western Kentucky University, Eastern Kentucky University, Murray State University and Morehead State University. To identify the prevalence of EI instruction in these undergraduate programs, a document analysis of program catalogs and program websites was conducted. Findings indicate that there is a lack of required EI courses in

the curriculum for students seeking degrees in business administration, management, or leadership.

### **Government Approval during Crises**

Author: Adam Ruschell  
Major: Political Science  
Sponsor: Shauna Reilly

National Crises are becoming all too familiar in our country. Much Literature has been published around the effects that they hold over governmental approval ratings. Recent crises have had a major effect on our world and its leaders. This offers the questions of what happens to government approval ratings during crises. The creation and distribution of a 20 question survey will help test hypotheses as to what will happen to such a crucial part of public opinion. Furthermore, a conclusion and explanation can be drawn that it depends on a multitude of factors that revolve around changing circumstances.

### **Black and Blue: The Story of Two Conflicting Communities**

Author: Erika Salter  
Major: Social Work  
Sponsor: Megan Lindsey

There are clear biases between law enforcement and urban communities having resulted in strained community relations. The purpose is to understand how interactions with law enforcement impact a young adult's perceptions of police in urban neighborhoods. A brief interview will be conducted to evaluate emerging themes within individualized experiences with law enforcement. Results are expected to show how interactions with police have direct implications on someone's perceptions of law enforcement. The implications of this study will set a precedent for future standards of interactions for law enforcement in urban communities to heal and promote a mutually beneficial relationship.

### **The Effect of Health Disparities on Academic Success**

Author: Arleene Salyer-Oliver  
Major: Social Work  
Sponsor: Jessica Averitt Taylor

Health disparities are preventable differences in health resulting from a social problem that disproportionately affects marginalized populations. The purpose of this study is to determine how disparities in health affect academic performance. Data was collected through a cross-sectional study using non-probability, simple random sampling survey distributed through social media. Results showed that health status had no effect on academic performance however data may have been significantly impacted by the pandemic occurring at the time of data collection. The results of future research that examines the intersectionality of gender and racial identities can be used to advocate for increased accessibility to health care for students



### **The Crisis of Mental Well Being During the Covid-19 Pandemic**

Author: Justin Sanford

Major: Social Work

Sponsor: Jessica Averitt Taylor

COVID-19 has now claimed the lives of over 580,000 Americans, but fighting a pathogen is not our only national crisis. Research reveals the proportion of people facing mental health challenges rises in the aftermath of such a large-scale disruption. This exploratory, cross sectional study aims to provide a picture of how the COVID-19 pandemic is affecting mental health outcomes by using non-probability purposive sampling. 391 adults provided data through a self-administered survey. Data reveals the depth of the mental health crisis we are in while providing insight for how social work clinicians can impactfully respond.

### **Reducing Racism and Pandemic Stress with African Communal Dance: A Collaborative Project Combining the Power of Art & Neuroscience**

Author: Caitlyn Scherpenberg, Kelsey Donahue, Christine Curran, Jeanita Olówè, and Tracey Bonner

Major: Neuroscience and Psychology

Sponsor: Christine Curran

The COVID-19 pandemic and Black Lives Matter protests of 2020 combined to create unusual and unique social stresses on college campuses. Dance and music have been used extensively for therapy, but NKU has a unique opportunity to explore the intersection of arts and neuroscience with a new African Communal Dance class (DAN 428). A pilot study was undertaken during Fall 2020 and Spring 2021 to determine how participation in DAN 428 or learning about African Communal Dance (control group in Biology) affects a student's ability to cope and student attitudes toward race. Current data implies that participation in the course did qualitatively reduce stress.

### **Engagement effects on mood during COVID-19**

Author: Alban Schneider

Major: Social Work

Sponsor: Megan Lindsey

This study investigates the effects of COVID-19 on student mood and if current engagement methods have been affecting these changes. A survey had been designed and distributed to the NKU student population. The results concluded with insufficient participation to statistically identify any correlation on mood and engagement methods in the overall student population. This conclusion, though statistically irrelevant, did provide indications of positive or no effects of engagement on mood rather than negative in members that participated in the survey.

**Public Opinion on Wealth Inequality in the United States**

Author: Sydney Scranton

Major: Political Science

Sponsor: Shauna Reilly

The purpose of this research was to investigate the overall public opinion surrounding wealth inequality in the United States. The goal was to determine what factors affected public opinion and perception of wealth inequality. This was investigated by looking at preexisting literature as well as by conducting a survey.

**The Impact of tRNA-Phe Anticodon Loop Modifications on Oxidative Stress Recovery in *Saccharomyces cerevisiae***

Author: Samuel Seibert, Alexis Eckart, and Michael P. Guy

Major: General Chemistry

Sponsor: Michael P. Guy

Transfer RNA anticodon loop modifications in the form of 2'-O methylations are critical for efficient translation in *Saccharomyces cerevisiae* (brewer's yeast). The methyltransferase Trm7 associates with proteins Trm732 and Trm734 to methylate the thirty-second (C-32) and thirty-fourth (G-34) nucleotides of tRNA-Phe, respectively. Yeast strains lacking either modification show healthy phenotypes, but sick growth is exhibited when both modifications are absent. Because oxidative stress necessitates efficient protein production, translational deficiencies may be magnified in *trm732Δ* and *trm734Δ* exposed to oxidative stress. It is established that *trm7Δ* mutants show lowered oxidative stress resistance, but the relative extent of *trm732Δ* and *trm734Δ* stress resistance is less understood. Spot tests confirm lowered stress resistance in *trm7Δ* mutants, but not in *trm732Δ* and *trm734Δ* mutants.

**NKU Course-Based Undergraduate Research Experience: The Identification of Potential Aromatase Inhibitors Based on Computer Modeling**

Author: Samuel Seibert, Ayanav Roy, Lili Ma, and Liat Ungar

Major: General Chemistry

Sponsor: Lili Ma

Microwave-assisted palladium catalyzed alpha-heteroarylation reactions were performed to join tropinone with heteroaryl halide compounds 4-bromoisoquinoline and 6-bromoquinoline to obtain potential aromatase inhibitors for the treatment of breast cancer. Computer modeling reveals that both target products show high enzyme-pocket docking scores compared to other tropinone-heteroaryl products synthesized in this course-based research lab. Herein, binding pocket interactions of various tropinone-derived compounds are compared to provide a rationale for further testing of these target products.

## **UROCC– UNDERGRADUATE RESEARCH IN ORGANIC CHEMISTRY COURSE Synthesis of heteroaryl molecules I80-H51 through a palladium-catalyzed heteroarylation**

Author: Payton Seig

Major: Biological science

Sponsor: Lili Ma

When people think of medical advancement, most people think of biology or genetics however heteroaryl compounds found in organic chemistry are just as important to medical advancements. During this Course-based Undergraduate Research Experience (CURE) we looked at a palladium catalyzed  $\alpha$ -heteroarylation of tropinone by the irradiation from a microwave at 180 °C 20 min. In an attempt to successfully make a  $\alpha$ -heteroaryl compound we used a 1.1 eq tropinone, 1 eq heteroaryl halide H51, 2.4 eq of NaOt Butanol, 2 mol% of XPHos Pd, in a 2 mL of toluene. This data could be further advancements for not only breast cancer but many other types of pharmaceutical targets with possible metal-chelation integrations.

## **The Impact of Personality Adaptability on Job Satisfaction**

Author: Maria Seiter

Major: Psychology

Sponsor: Dr. Kinsey B. Bryant-Lees

Previous research has shown that personality differentially impacts job satisfaction; e.g. conscientiousness has been shown to be a strong predictor of job satisfaction. This relationship may be over simplified due to the assumption of unidimensionality present in self-report measurement. We employed data collected using a new response format combining a funnel response format with Item Response Tree modeling to account for three proposed underlying processes of personality: adaptability, traitedness, and trait level. Job flexibility was found to be a significant predictor while conscientiousness was negative. Given that our results differed from past studies, this relationship may not be linear.

## **Conditions at the U.S./Mexico Border**

Author: Miranda Seta

Major: Social Work

Sponsor: Megan Lindsey

There are 50,000 individuals a year that are being detained at the U.S./Mexico border, often seeking asylum from their country due to violence. Once detained, families are separated and are not given adequate care while detention center conditions deteriorate. The purpose of this study is to understand what asylum seekers endure when coming to the U.S./Mexico border. In this study I will interview individuals that have been detained, have had loved ones detained and social services workers on the front lines. This study will be of interest for human rights activist, policy and law makers and all U.S. citizens to shed light on the atrocities happening at the border.

**Impact of Perceived Discrimination on Healthcare Access in College Students**

Author: Savannah Shiveley

Major: Social Work

Sponsor: Reiko Ozaki

Perceived discrimination in healthcare settings influences vulnerable populations, fostering feelings of distrust and decreased engagement in care. Literature regarding the impact of discrimination on college students is scarce. This study examines perceptions of discrimination in healthcare settings and their impact on access to healthcare in college students. Data were collected by administering online surveys via social media. It is expected that individuals who experienced more discrimination are to access healthcare less often than those who have not had these experiences. Findings could be used to better understand the relationship between perceived discrimination and its impact on healthcare access among college students.

**A History of Punishment: The "Angry Black Woman" Trope in TV and Film**

Author: Savannah Slaby

Major: Integrative Studies

Sponsor: Steven Watkins

In film and television, we see many things mirrored in society. Media and art are based on real life, so it is no surprise why it impacts our entertainment. But, there have been certain tropes created due to this. The issue arises when a movie trope is made out of an oppressed minority group, generalizing and stereotyping their entire community. Black women are rarely ever portrayed as sweet and innocent, intelligent and driven, or shy and reserved. Black women have been consistently portrayed as loud, brazen, and angry, also known as the angry black woman trope. Examples of this are prevalent in films such as Viola and Minny in *The Help*, Deloris in *Sister Act*, Trudy in *Couples Retreat*, and even cartoon characters like Honey in *The Incredibles*. This trope is so damaging because it inherently impacts people by giving them implicit bias, which causes society to make rash assumptions and judgements about black women in real life.

**Support and Resources provided to DV survivors on College Campuses**

Author: Brittany Smith

Major: Social Work

Sponsor: Megan Lindsay

At least 1 in 4 women and 1 in 7 men have experience domestic violence across the nation. This study is design to demonstrate the prevalence of support and resources provided to domestic violence survivors on college campuses. As domestic violence continues to increase across the nation it is vital to learn how survivors within colleges receives support and resources. A brief survey will be used to collect data from survivors on college campuses. This research will provide understanding on what resources and support is being provided across campuses. The results will indicate that universities lack services for survivors.

### **Women In Drug Rehab**

Author: Jessica Smith

Major: Organizational leadership

Sponsor: Megan Downing

The need for drug rehab for women has grown over the years, however there remains limited drug rehab help for women and limited research addressing this need. Most research focuses on men and centers primarily focus on the male population. Because men and women react differently to chemical intervention, their rehab needs may differ. Circumstances that influence women's drug use can also be quite different from issues that trigger drug abuse among men. With these factors in mind, and with the need to address the increase in women who need drug rehab, it is important to explore factors that influence drug abuse among women and prevent them from breaking the cycle. Further, it is essential to better understand the emotional, physical, mental, and spiritual needs of the women who are caught in this vicious drug abuse cycle and provide services that focus on the unique needs of women to help them transition back into society.

### **Tackling Lack of Inclusiveness in Organizations**

Author: Kourtney Smith

Major: Integrative Studies

Sponsor: Rhonda Davis

It is clear that with recent current events such as the Black Lives Matter movement, the killing of George Floyd shining light on other police brutalities against black people, and the lack of minority voices which continues to be prominent for decades, there is an obvious need to focus on inclusion, and this need is far past due. The current lack of inclusiveness in organizations can only be solved by the integration of multiple disciplines, whether this is acknowledging policy changes, being able to provide resources like counseling, or providing education on the history of inclusiveness, or the lack there of, all of these steps derive from different disciplines. When combining research from Human Resources, Women and Gender Studies, and Social work, the lack of inclusiveness in organizations across the world can be changed into more diverse, inclusive, and safe environments. It important to understand that the issue of organizations lacking in inclusion is an important and complex problem, and I have provided examples of what inclusion means to different disciplines, as well as different organizations to further explain it's importance.

### **COVID-19's Impact on Northern Kentucky, as Explored in Wastewater Testing**

Author: Rachel Smith

Major: Journalism

Sponsor: Michele Day

This news story investigates an initiative's attempt to track the impact of COVID-19 on Northern Kentucky through wastewater analysis. Previous articles have explored wastewater testing during the pandemic, but a story has never investigated a local initiative and explored wastewater as a developing science in the United States. Wastewater can contain traces of the virus from infected individuals, and these results can quickly estimate the pandemic's impact on an area. I interviewed several members of this initiative on their contributions and perspectives. This story shines light on a community-driven initiative's attempt to better understand public health during an international crisis.

**Public Opinion on Abortion**

Author: Madison Snapp

Major: Nursing

Sponsor: Shauna Reilly

In my presentation I plan on discussing the main gap I found in the literature when it came to public opinion on abortion. While I was doing my literature review, I noticed there was no information of research done on the political affiliation and how it correlates with the agreement or dis-agreement with government funding for abortion. As well as describing my attempt of filling that gap with my research. The goal of my research was to fill the gap in the literature that was about government funding for abortion and how that correlates with political affiliation. I attempted to do this by creating a twenty-question survey via Qualtrics and sent it through an anonymous link. With the respondent total being 68, I found there is a relationship linking the partisanship and government involvement with abortion funding.

**The Effect of Biased Training Data in Self-Driving Cars**

Author: Olivia Snowden

Major: Computer Information Technology

Sponsor: Richard Fox

Self-driving cars rely on trained machine learning algorithms to navigate the world around them. I present results from experiments that test whether biased training data effects a self-driving car's ability to identify obstacles in the road. I wrote a machine learning algorithm and created biased and unbiased datasets to train and test the algorithm appropriately. When the algorithm was trained with a biased dataset but tested with an unbiased dataset, the accuracy of the model was poor. This concludes that bias in a self-driving car's machine learning algorithm does impact the algorithm's performance and hinders its ability to interpret the world around it.

**Online Radicalization: Containing the Contagion of Conspiracy**

Author: Kate Snyder

Major: Integrative Studies

Sponsor: Rhonda Davis

Eye-catching, fear-inducing headlines connecting online radicalization to real-life violence has many wondering if this problem is a side-effect of nationwide political divisions or simply a growing-pain in the internet's coming-of-age. Taking an interdisciplinary approach, this research paper aims to address these questions by using the recent rise of QAnon as a case study for understanding radicalization, its history on the internet, the circumstances under which it takes place on an individual basis that can gradually snowball into a larger entity, and the attempts by social media platforms and governmental bodies to legislate the problem. Additionally, by utilizing the focus areas of history, psychology, and political science, this research is intended to offer a broader perspective and education for the public so that preventative action can be achieved one person at a time.

**Human Trafficking Recruitment Methods**

Author: Natalie Soto

Major: Social Work

Sponsor: Caroline Macke

Human trafficking is an abuse of power that occurs toward an individual to obtain goods and services. This study was designed to determine, from a regional perspective, how many people are aware of the recruitment methods used for human trafficking. Data for the exploratory, cross-sectional study will be collected through non-probability, purposive sampling during an eight-question survey distributed through social media. Findings will assist social workers in providing education on human trafficking and recruitment methods.

**The Administration of The Mithraic and Eleusinian Mystery Cults: How They Compare**

Author: Coralynn Spicer

Major: Integrative Studies

Sponsor: Kathleen M. Quinn

Human beings love mysteries, and this past year I have focused on ancient mystery cults, with a particular interest in the kinds of punishments faced by those who shared the secrets. To be considered a mystery cult, sacred knowledge of the group must have only been available to initiates. For the Mithraic mysteries, knowledge was granted to male soldiers of the Roman Empire who swore allegiance to the Roman emperor in rituals to Mithras in underground chambers called mithraea. The Eleusinian Mysteries, active in the Greek and Roman periods, accepted both men and women as initiates, but they were chosen after a year-long series of festival acts. While little is known of the cult rituals, I was able to offer insight into ideas of punishment, rooted in the cults' ideas about acceptance, intention, and fairness.

**Identification of the enzyme required for the acp3U modification in plastidic tRNA**

Author: Sarah Spigelmyer and Holly M. Funk

Major: Chemistry

Sponsor: Dr. Michael P. Guy

Posttranscriptional tRNA modifications are essential for protein translation and proper cell growth. Defects in human tRNA modifications are associated with diseases such as cancer, type two diabetes, neurological disorders, and mitochondrial-linked disorders. The 3-amino-3-propylcarboxyuridine (acp3U) modification on tRNA is found in bacteria, plants, and animals, but not in yeast. DTWD proteins were recently identified as the enzymes responsible for acp3U modifications on eukaryotic tRNA. DTWD2 was shown to be responsible for the acp3U modification at residue 20a in human cells. We determined that DTWD2 forms acp3U20a in *D. melanogaster* cells. In *A. thaliana*, there are three homologs of human DTWD2 which are DTWD2A (AT2G41750), DTWD2B (AT5G54880), and TapT-like (AT1G03687). Our lab was able to identify that the aspartate and tryptophan residues of the DTWD2A protein in *A. thaliana* are required for modification activity and we were able to determine that it forms acp3U at position 20b on the tRNA. This was determined by expressing *A. thaliana* tRNA and *A. thaliana* DTWD2 genes in *trm1Δ met22Δ* yeast cells and testing by primer extension with fluorescent oligonucleotides. It is the current aim of this work to utilize the methods used to identify DTWD2A as the enzyme responsible for acp3U at position 20b to identify the substrates of the DTWD2B and Tap-T like proteins. From this research we hope to better understand gene expression in multiple model multicellular eukaryotes.

### **Riding the Pulse through Critical Entertainment Journalism: Ethnography of Film Critics**

Author: Joshua Stephenson

Major: Anthropology

Sponsor: Dr. Jessica Lott

Due to limited access to education and job positions, film critics face structural gatekeeping in finding the role they play in the diverse public media representation of films and television. Based on unstructured interviews, email correspondence, and social media interaction between October and November 2020, this project highlights the hierarchical structure of entertainment journalism as well as the platforms on which it takes place. The ethnography focuses on nine freelance, permalance, and staff writers as well as editors who provided insight into the pressures of finding and maintaining one's niche and relationships within the critical entertainment journalism industry.

### **Perceptions of Law Enforcement and Social Work Collaboration**

Author: Cara Sumner

Major: Social Work

Sponsor: Jessica Averitt-Taylor

Nationally, crime incidents increasingly gain media attention. Media sources increasingly criticize police, suggest they are given too much authority/responsibility and argue that situations would have been better addressed by social services. This study explores the perceptions of individuals that have had previous interaction(s) with law enforcement, and if they feel their situation would have been better addressed by social services. Data is collected virtually via a self-administered 5-minute survey. This research will result in targeted policy initiatives and improved social service interventions for law enforcement interactions, as well as an improved and targeted research focus based on these preliminary results.

### **Predicting Public Opinion on Abortion Laws**

Author: Joanna Swaiss

Major: Political Science

Sponsor: Shauna Reilly

How do certain demographic characteristics predict public opinion on abortion laws? I proposed to test two theories of public opinion attitudes (the role of race and religiosity on support for abortion). After an extensive literature review, I developed a twenty-question survey to test this. The results demonstrate that greater religiosity leads to less support for abortion; however, limited relationships between race and support, contrary to the literature.



**No relationship between clutch size and the embryonic heart rate of Eastern Blue birds**

Author: Marissa Tendam

Major: Biology

Sponsor: Lindsey Walters

Natural selection will favor birds that maximize their fitness with a clutch size that will produce the most viable offspring while not being too stressful to take care of. We predicted that nests with a larger clutch would have a slower development, and therefore a lower heart rate, since it would be more difficult for the mother to incubate all the eggs evenly. For this study we used the Buddy digital egg monitor, which uses infrared light absorption in order to noninvasively measure the embryonic heart rate, on Eastern bluebird (*Sialia sialis*) eggs to determine if the clutch size had any effect on the heart rate of the individual eggs. We collected 237 readings from individual Eastern Bluebird eggs which came from 28 different nests. Contrary to our prediction, our results showed that the clutch size had no effect on the heart rate of the eggs. However, we did find a positive relationship between embryonic heart rate and both age of the eggs and external temperature. This study provides new information on the embryonic heart rate of wild birds and more insight on the different factors that may impact the rate.

**Veteran Reintegration on College Campuses**

Author: Michaela Terry

Major: Social Work

Sponsor: Caroline Macke

The literature suggests that there is a chasm between civilians and veterans, with many civilians having negative perceptions of veterans (e.g. aggressive, mentally unstable). The literature has not yet explored whether these perceptions also exist among college students. Examining this topic is essential since veterans are entering universities at higher rates than ever before. By means of an electronic survey, distributed through social media, this study will examine college students' perceptions of veterans. The findings from this study are expected to show that civilian college students have negative perceptions of veterans, similar to those held by the general civilian population.

**How Brands use Images on Social Media Platforms to Influence Consumer Behavior**

Author: Jade Tillett

Major: Marketing

Sponsor: Kimberly Roush

This study examines how brands utilize images to maximize interest and retention among their consumers. Specifically, how Instagram can be a channel for startups and larger companies to successfully create stronger brand trust. Study 1 involves "LXFIT", a startup health/fitness brand, and quantitatively measures how well images and posts do based on a SurveyMonkey. Study 2 involves a larger company, Plato's Closet, rooted in sustainability and clothing. This study will involve a social media audit and content analysis for the companies. This study proves that carefully curated images lead to high engagement rates and consistent revenue.

**Influences on Abortion and Abortion Legislation in Relation to Public Opinion**

Author: Mallory Trame  
Major: Political Science  
Sponsor: Shauna Reilly

The existing literature on public opinion of abortion and abortion legislation supports the assertion that three main factors influence public opinion more than others. The main factors that continued to be discussed in the sources provided were partisanship, religion, and gender influences on public opinion of abortion and abortion legislation. The goal of this paper is to show through the data collected and literature support that these factors influence public opinion on abortion and abortion legislation in a variety of ways and will continue to be prominent influences for years to come. This is included in the theory and the two hypotheses provided to support that theory. The findings of the survey indicate that there are direct relationships between these three factors and public opinion on abortion. However, due to there being more women respondents than male respondents, the data is skewed in the gender section of the results.

**Cultural Competence and Empathy for Japanese in America**

Author: Abigail Turley  
Major: Integrative Studies  
Sponsor: Rhonda Davis

Much attention today focuses on the journey of immigrants to America, but less popular is acculturation and adaption that marks immigrant's new lives here. This paper focuses particularly on the story of Japanese immigrants in America. They face barriers such as language acquisition, resource awareness, and Socio-cultural difference native-born Americans have never experienced. Drawing on the history of political interaction between Japan and America, English language acquisition, and intercultural communication styles, I look at struggles and supports for them in the US. I finish by asking what we can do as individuals to be supportive to Japanese in our community.

**Microwave Irradiation of Heteroaryl Compounds with Tropinone for the Synthesis of Aromatase Inhibitors**

Author: Liat Ungar and Samuel Seibert  
Major: Biology  
Sponsor: Lili Ma

Heteroaryl compounds are important molecules with extensive significance in medical chemistry. In our lab, we reacted heteroaryl compounds (4-Bromoquinolone) with tropinone using microwave irradiation at 160°C and 180°C in the presence of palladium catalyst. Techniques such as NMR, MPLC, and computer modeling were then utilized to isolate and purify the compound as well as assess its potential as an orally active drug. Overall, this research is significant because the product obtained could possibly serve as an aromatase inhibitor which would help in the treatment of breast cancer patients.

**Quality of Mental Health Treatment and Academic Success**

Author: Samantha Van Dyke

Major: Social Work

Sponsor: Jessica Taylor

The quality and accessibility of mental health providers available to minority and marginalized populations directly impacts the academic success of college students. Research studies have identified the limitations experienced in rural, lower income, and less diverse areas. Data will be collected by a self-administered 5-minute survey. The results from this survey, will help to confirm a direct correlation with poorer academic success to poor mental health treatment in minorities. Once this is supported, this will show a need to implement a more diverse group of providers for higher quality care and more accessibility to treatment for minority populations.

**More Than Just Quality**

Author: Vivi Vincent

Major: Integrative Studies

Sponsor: Jeff Varrone

Specialty coffee farmers face many challenges in production. The purpose of this paper is to investigate these challenges that specialty coffee farmers face in order to identify the factors that impact the price of specialty coffee, to communicate with customers why they pay a premium for their coffee. The research in this paper includes industry articles, dissertations, and peer-reviewed journal articles centered around the production of specialty coffee and its impacts on farmers. To further enhance the research, I conducted three interviews with Mid-western specialty coffee roasters to gain insight into their interactions with producers and their direct trade models. I found that commodity pricing on coffee severely impacts the volatility of this industry and disregards common business profitability models. The conclusion is that direct trade and relational coffee models add value to consumers and producers. These models employ common business profitability models, but the coffee is more expensive and higher quality than what consumers may expect.

**Female Sexual Harassment in Higher Education**

Author: Jessica Vogel

Major: Social Work

Sponsor: Jessica Averitt Taylor

Sexual harassment towards females is highly prevalent in multiple environments, especially on college campuses. The research shows 59.2% of undergraduate female students experienced harassing behavior, reporting the highest levels of sexual misconduct incidents out of all genders surveyed. Female students who experience sexual harassment, 61% are undergraduate and 65.8% are graduate, also experience negative emotional and academic outcomes. This cross-sectional, self-administered online survey examined the prevalence of sexual harassment on NKU's and other college campuses, and illustrates the negative impacts it has on female students. These results bridge the gap in research and give additional insight into how to better serve students' needs.

**Responsibility of Climate Change within American Communities**

Author: Tessa Wagner

Major: Integrative Studies

Sponsor: Steven Watkins

Why isn't the American public better informed about climate change and ways to help combat its effects? I propose that certain factors within the crisis of climate change are impacting the lack of interest and or denial about the importance of finding a solution to climate change. This complex problem has arisen in our contemporary society but hasn't been given adequate attention. This issue is worthy of more aggressive attention by the public because climate change affects everyone. My intention is for people to take a look at the world around them and be motivated to realize the effects of climate change are occurring and for them to educate themselves in order to find/implement ways to stop it. My argument is that if people of the world keep denying the fact that climate change exists then what is going to happen if it's actually real and causing our planet to die? I am focusing on American communities because I find as an American there are a huge amount of factors that go into the communication of important world issues and as we have seen with the current pandemic, these factors are lacking majorly. American communities will be better off with proper communication because there will not only be a shared knowledge about how to help our planet survive but the motivation to realize the dire consequences of each other's actions. Overall climate change can be stopped but Americans need to realize our place in the world and make an effort to change our ways. Improving our communication and knowledge about climate change will make a positive impact on our society and our future lives.

**Course-Based Undergraduate Research (CURE) Integration Increases Student Overall Success**

Author: Bridget Wallace

Major: Biological Sciences

Sponsor: Lili Ma

Traditional learning in undergraduate STEM degrees is not always conducive to all learning styles, especially when it comes to performance in a lab environment. Course-based Undergraduate Research Experiences (CURE) allow a broader range of students the opportunity to participate in scientific research, while also engaging these students in a new style of learning. Northern Kentucky University implemented CURE labs to embrace real-world techniques and give drive and meaning to the work that each student performs in the lab. Ultimately, CURE labs improve students' success in STEM and in college, as well as make research more accessible to a broader scale.

## **URROC- Undergraduate Research in Organic Chemistry Course Synthesis of Heteroaryl Molecule I80-H53 through Palladium Catalyzed Heteroarylation**

Author: Elizabeth Watson

Major: Biological Sciences

Sponsor: Lili Ma

Our research focused on the properties of several heteroaryl molecules which had never been synthesized in the hopes that they will help find better treatment for breast cancer. 2.4 NaOtBu, 2% XPhos Pd Gen 4, 1.1 tropinone (I80), 1 heteroaryl (H53), and 2 mL of toluene molar equivalents were used in the synthesis. This mixture underwent microwave irradiation to produce the heteroaryl tropinone product. This product was purified using acetone centrifugation and acid-base extraction and then identified using NMR. The synthesized molecule may be able to function as an aromatase inhibitor and help treat hormone receptor-positive breast cancer.

## **Burnout**

Author: Caleb Wears

Major: Organizational Leadership

Sponsor: Megan Downing

When you hear of the term “burnout” what is your first thought? Maybe you think of a dead-end job that someone may be working, and they have just had enough? Or maybe you think of a student that has just way too much work on their plate and does not know how to finish it all? Or maybe you just think of someone that cannot keep going with everything that they are going through. If you thought of anyone of these thoughts, then you are absolutely right and then some. Burnout is something that everyone faces at some point when it comes to their work, career, living situation and even their own friends and family. There are many different types of burnout as you can see but the two most important things that you should know about burnout is one, being able to recognize it and know what to do to fix it because in many cases, we realize that we are burnt-out and cannot find a solution to combat it. While going into many different professions and looking into the research and the implications of burnout in certain job fields would yield some pretty interesting results, I am looking at burnout strictly in a leadership standpoint.

**Impact of Maternal Helminths on Learning and Memory**

Author: Madeleen Weaver and Olivia DeMoisey

Major: Biology

Sponsor: Dr. Lauren Williamson

Neuroinflammation can occur during development and cause cognitive impairments. Helminths have been shown to reduce cognitive dysfunction and inflammation if given to mom and pups, but never if given to moms before she has her pups. We hypothesize that maternal helminth colonization will reduce the cognitive impairment associated with neonatal *E. coli* infection and an LPS injection in adulthood. We also hypothesize that maternal helminth colonization will reduce neuroinflammation in pups following an *E. coli* infection. Mom rats were inoculated with helminths to act as anti-inflammatories to observe effects on her offspring early in life and when they are trying to learn as adults. PCR arrays were run on the tissue of the hippocampus of P1 and P4 pups. Context Pre-Exposure Facilitation Effect was then performed on P60 rats to evaluate freezing on the third day. Results showed that there was a significant difference between females and males, with females freezing more than males, especially when given LPS. Rearing and grooming showed no significant difference. The PCR arrays on the P1 and P4 pups showed change in neonatal brains depending on mom treatment, sex, and age. We can start to see more gene expression within certain genes depending on the gender and treatment the mom received and the age of the neonates. In conclusion, adult female rats froze more than males, but more research will continue as more rats are added to the Context Pre-Exposure Facilitation Effect paradigm. In neonatal brains, there are various variables affecting cytokines. Those variables include maternal treatment, sex, and age. Research will continue as more rats are added to explore these findings.

**The Effects of Cancel Culture: Examining The Public's Response to Apologies and its Lasting Impact on Reputation Recovery**

Author: Alyssa Weber

Major: Journalism

Sponsor: Stacie Meihaus Jankowski

"Cancel Culture", or cancelling describes the act of no longer supporting an individual, typically a public figure due to questionable behaviors. In 2020 alone, there were more cancel cases than any other year to date. Even though some were accused of exhibiting similar behaviors or making similar comments, the public responded differently, and therefore these canceled public figures were affected differently. This project will examine two "cancel cases" and how their careers were affected one year after their respective allegations occurred.

## **The Synthesis of Tropinone and Heteroaryl Compounds to Create Aromatase Inhibitors**

Author: Hannah Wells

Major: Biology

Sponsor: Lili Ma

The purpose of this experiment was to study the heteroaryl molecule, I80-H37. This molecule includes a tropinone scaffold and a heterocyclic ring, nitrogen heterocycles are important and used in pharmaceuticals due to their active agents that result in optimization of the properties of drugs/drug candidates. Heteroaryl compounds are important in the medical field. Our research will specifically provide helpful information regarding the aromatase inhibitors that may be useful in fighting breast cancer. It will also give students the opportunity to excel by providing them experience in Undergraduate Research in Organic Chemistry Course (UROCC) and Course-based Undergraduate Research Experiences (CURE).

## **Human Trafficking Knowledge Among College Students**

Author: Kayleigh Wilhoite

Major: Social Work

Sponsor: Reiko Ozaki

Knowledge and awareness of human trafficking among college students.

The recent studies about human trafficking in the U.S. has increased, which causes the views of what human trafficking consists of can be unsettling due to lack of knowledge and awareness. The US State Department estimates there are almost twenty-five million human trafficking victims worldwide. This study will be exploring the knowledge of human trafficking on college campuses with an online survey being shared on social media platforms. Findings from this study could be used to inform future research on college campuses and the awareness levels to human trafficking

## **Integrating Creativity: Measuring helping professionals' willingness to implement creative interventions**

Author: Shannon Wilson

Major: Social Work

Sponsor: Megan Lindsey

Though research supports the use of creativity within the helping profession, it remains unclear how willing professionals are to use these modalities. This study aims to measure helping professionals' perception and willingness to implement creativity within their existing practice. A brief self-report survey was administered and completed by 52 graduate level social work and counseling students. Results showed that a majority of helping professionals view creativity as important within the profession. Nearly half of respondents reported that they did not feel equipped to provide these interventions, but 92% reported be willing to obtain additional certifications in order to do so.

**Reducing Funerary Pollution through Greener Burials**

Author: Kayla Winkle

Major: Integrative Studies

Sponsor: Rhonda Davis

Traditional burials and cremations are the most common methods of burials, but require many resources and cause pollution to the soil and air. Greener burials are a solution to this pollution by reducing the amount of carbon dioxide emitted in burials and limiting the number of resources and land used in burials. There is a lack of education on green burials that has led people to disregard them and continue with their traditional methods of burial that appease their religion and culture. However, with education society can realize that burials can be environmentally friendly and satisfy their spiritual needs.

**Synthesis, Purification, and Computer Modeling of I80-H37**

Author: Makayla Wright

Major: Neuroscience

Sponsor: Lili Ma

Heteroaryl compounds have been shown to hold a prospective significance in pharmaceutical circumstances. I80 and H37 represent the molecules tropinone and 3-bromoquinolone, respectively. As such, this research focuses on the synthesis of heteroaryl compounds with a tropinone scaffold. Furthermore, the efficacy of these target compounds as an aromatase inhibitor can be analyzed. To predict this, computer modeling was utilized with relation to three major molecular interactions: hydrogen bonding, heme chelation, and hydrophobic interactions. Molecules that contain these interactions are thus an effective aromatase inhibitor. This is correspondingly reflected through the molecule's docking score-- a higher score demonstrates stronger inhibiting properties.

**Correlation between Joint Laxity and ACL Tears in High School Athletes**

Author: Shania Young and Kathy Boehmer

Major: Athletic Training

Sponsor: Rachele Vogelpohl

Anterior cruciate ligament (ACL) tears are common injuries among the teenage athletic population, and research indicates that individuals with increased joint laxity can have multiple anatomical and physiological differences. Previous studies have found support for joint laxity as a predisposing factor to ACL tears. The results from a retrospective chart review examining joint laxity in high school athletes who have sustained an ACL tear are explained in this presentation. These results suggest that joint laxity had the largest effect in females, particularly playing soccer or basketball. This study supports joint laxity as a predisposing factor in female athletes compared to males.