

Xavier University

## Exhibit

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Celebration of Student Research and Creative  
Activity

Undergraduate

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2023-04-21

## Celebration of Student Research and Creative Activity 2023 Abstract Booklet

Xavier University (Cincinnati, Ohio)

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## Celebration of Research

### April 21, 2023

*Abstracts arranged by department*

**Aleni Antalis, Jenna Wood** (Dr. Suzanne Chouteau, Art)

Alter Hall Poster Session 2 - 2nd floor 4:00-4:45 pm

*A Capsule of Time, Art and Culture*

Titian, Giorgione, Bellini, Tintoretto and Veronese covered every inch, every corner, of the beautiful city of Venice. Before our classes even began in Rome, we were students of the Venetian Masters, studying the works that paved the way for future artists, teachers, theologians, and historians. It became clear within minutes the impact works like *Creation of the Animals* (Tintoretto, 1550) and *The Feast in the House of Levi* (Veronese, 1573) have on how our society functions. While abroad, we studied hundreds of paintings, frescos, and sculptures that were the first history books used to teach religion or morals. These works came out of a time where reading was a delicacy, pushing art to the foreground of educational tools. Standing under these ceiling-high works does one only then understand the magnitude art has in teaching history and culture to past, present, and future generations.

This impact art has on a community continues today in modern art and is what fuels us to be a part of this new, contemporary, art movement. Being a front row student to this history book we call art is like a magnifying glass on the culture of that time period. Hundreds of years from now, modern day society will be seen through art just like ancient Venice and Rome. The Venice Biennale projects this philosophy through the collaboration of 58 countries and 213 artists. Being a tool of communication, the 2023 Biennale gave a space for stories, experiences, and traditions to be passed down to students and masters alike. With open doors for connections and learning, citizens of the world grow together in the mind and the heart.

Art is a fascinating and beautiful instrument that holds the essence of the past, present and future. The art in Venice was much more than a painting on a wall, it was our map of the city, our looking glass into history and a time capsule of culture, literature, music and philosophy.

**Molly Thompson, Haley Esposito, Mary Sabourin** (Dr. Hanna Wetzel, Biology)

Alter Hall 207 3:20-3:40 pm

*Acute Effects of Caffeine and Ketamine on C. elegans*

Caffeine is a commonly used psychoactive substance found in beverages such as coffee and energy drinks to increase alertness and metabolism. While ketamine is an anesthetic used for surgical procedures and is also used as an illicit drug due to its hallucinogenic properties. The effects of both substances were measured to determine the effects of both a stimulant and a sedative on these organisms. *C. elegans* are small invertebrates that have recently been discovered to be a useful model in pharmacological studies. Additionally, *C. elegans* can provide data from a whole animal with intact, complex biological systems. In this experiment, *C. elegans* were treated with either caffeine or ketamine for four hours to determine their acute effects on locomotion and body movements. Regarding the locomotion assay that was carried out, *C. elegans* were placed within a circle in the middle of a petri dish. The organisms were then given thirty minutes to move around the dish, and the number of organisms that moved outside of the circle were recorded. Additionally, for the body bends assay the

number of reversals, forward movements, omega turns, and coils were recorded for seven worms. We found that there was not a significant effect on the locomotion of *C. elegans* when they were treated with caffeine or ketamine. However, regarding the body bends assay that was performed, we found a significant decrease ( $p < 0.05$ ) in the number of forward movements in *C. elegans* treated with caffeine or ketamine.

**Mauricio Dominguez, Julia Driggers, Maryam Khzyr, Jack Pluth, Meghan Graber, Hayley Barta** (Dr. Wilber Escorcía, Biology)

Alter Hall 207 3:40-4:00 pm

*The contribution of lipid regulators Sre1 and Dga1 to the genotoxic stress response in fission yeast*

Lipids are essential for cell growth and maintenance, intracellular signaling, and cellular energetics. When exposed to environmental insults, cells activate lipid metabolism programs that facilitate the response, recovery, and exit from stressful conditions. Failure to regulate lipid storage and utilization is associated with accelerated aging, which compounds genomic instability. In this study, we examined the genomic and physiological consequences of disruptions to two lipid regulator genes, SREBPF1 and DGAT1, frequently mutated in human cancers. We used the Catalogue of Somatic Mutations in Cancer (COSMIC) to interrogate the link between mutation profiles and mean age at time of sequencing (MATS), tissue distribution, and primary tumor histology. Employing Cancer-Related Analysis of Variants Toolkit (CRAVAT) and Variant Effect Scoring Tool (VEST) algorithms, we tested for driver and passenger mutations. We observe the majority of mutations in SREBPF1 and DGAT1 affecting large intestine, liver, skin, and stomach tissues. In SREBPF1, there is a mutation cluster localized to the HLH domain that mediates binding to DNA, thereby potentially interfering with gene expression. In DGAT1, the MBOAT domain harbors multiple mutations that likely disrupt enzyme function. Moreover, differences in MATS reveal aging trajectories that correlate with specific tissue or tumor types, thereby indicating cellular contexts that promote accelerated aging. Since the products of these genes show functional homology in fission yeast, we examined how lipid deregulation by a knock-out enzyme ( $Dga1^{DGAT1-DGAT2}$ ) and a transcription factor ( $Sre1^{SREBF1}$ ) influence the response to genotoxic stress in fission yeast. Using microscopy quantification of lipid staining, we observe abnormal homeostatic control of lipid levels in cells lacking Dga1 and Sre1. These phenotypes are enhanced in sub-lethal doses of DNA damage (UV-C light) and are associated with altered cell fitness and viability. Furthermore, in response to genotoxicity, these lipid regulator mutants exhibit abnormal cell dimensions and cell segmentation, which suggest disruption to cell cycle dynamics. These data indicate functional mechanisms that may contribute to the deregulated metabolic and physiological environments of prematurely aged cells in human cancers.

**Julia Driggers, Kennedy Kuchinski** (Dr. Wilber Escorcía, Dr. Hanna Wetzel, Biology)

Alter Hall 208 3:40-4:00 pm

*Comprehensive analysis of CYP2D6 mutations in human cancers*

The cytochrome P450 (CYP) enzymes are responsible for the metabolism of many drugs. Single nucleotide polymorphisms (SNPs) have large impacts on the activity of these enzymes and result in altered metabolism for a variety of drugs. Cancer patients frequently suffer from both chronic pain and depression, leading to co-administration of selective serotonin reuptake inhibitors (SSRIs) and opioids. CYP2D6 is necessary to convert SSRIs into their inactive metabolites and to activate several prodrug opioids. Ideally, to avoid drug-drug interactions in cancer patients when prescribing SSRI-opioid combinations, careful analysis of relevant SNPs through PCR in individual patients would be employed.

However, this approach remains technically and economically inaccessible to many cancer demographics and clinical settings. To address these limitations and provide genomic-based alternatives, we analyzed the frequency of CYP2D6 mutations in sequenced specimens from a varied pool of cancer patients. The primary goal of this study is to use cancer data trends linked to CYP2D6 DNA sequence disruptions to improve informed selection of SSRI-opioid treatments based on specific patient characteristics. We mined the Catalogue of Somatic Mutations in Cancer (COSMIC) from the Sanger Institute to identify CYP2D6 mutations occurring in patients with various cancers types. We also used the CHASM-3.1 and VEST-4 artificial intelligence algorithms from the Cancer-Related Analysis of Variants Toolkit (CRAVAT) to evaluate the functional significance of missense mutations. Results from CHASM reveal the probability of mutations either being drivers or passengers in cancer, while VEST indicates the likelihood of mutations being pathogenic. We found that 188 of 409 patients showed CYP2D6 mutations localized to the coding region. A majority of these (126) were missense mutations, 18 showed high pathogenicity, and no cancer drivers were identified. The three tissue types most frequently affected by CYP2D6 mutations were the large intestine (60), lung (58), and upper aerodigestive tract (49). The mean age at time of sequencing (MATS) for all tissues was 58.2 years. Three tissues showed significant age differences relative to the MATS of all tissue types: the urinary tract (mean=69.5,  $p=0.0080$ ), hematopoietic and lymphoid tissue (mean=49.1,  $p=0.0039$ ), and the stomach (mean=66.0,  $p=0.0027$ ). The primary histology associated with CYP2D6 mutations was carcinoma (327 of 409 patients). Intriguingly, cancers linked to lymphoid neoplasm histology had a significantly different MATS (mean=41.4 years,  $p=0.0002$ ) relative to all histology types (mean=58.2). The observed missense mutations in the conserved P450 domain of CYP2D6 suggest structural changes that likely affect protein function, thereby precluding effective metabolism of this enzyme's drug substrates. Therefore, these results indicate that cautious, personalized, and deliberate prescription should be used when co-administering opioids and SSRIs to patients who meet criteria associated with decreased CYP2D6 metabolism in the cancer contexts herein reported.

**Caitlin McCluskey** (Dr. Hanna Wetzel, Biology)

Alter Hall 302 3:20-3:40 pm

*Ketamine Pharmacokinetics*

Ketamine is an intricate drug with many indicated uses. These indications grow with more research leading scientists to believe that ketamine can be used not only for anesthesia, but depression, post-traumatic stress disorder. Ketamine is commonly used in hospital systems for comfort care of terminally ill patients which primarily is administered intravenously (IV). Other routes of administration include nasal and rectal insertion. To build the pharmacokinetic model to represent the movement of ketamine through a child and adult, it must be able to consider quantitative as well as qualitative data. Children and adults undergo 1<sup>st</sup> order absorption where the absorption rate is proportional to the concentration of the drug, with IV administration this is not relevant because it goes directly into the circulatory system. Using MATLAB, a three compartmental model was constructed to determine the clearance of ketamine.

**Ramon Chen, Heidi Arth, Tommy Scandura** (Dr. Wilber Escorcía, Biology)

Alter Hall 303 3:20-3:40 pm

*Liver Enzyme Mutations in Relations to Cancer*

It is known that deregulation of enzymatic functions is a direct consequence of recurring cancer mutations, and many cancers tend to metastasize to the liver. While many enzyme levels are monitored for the development or progression of cancer, only acetaldehyde dehydrogenase 2 (ALDH2), alpha feto-protein (AFP), and glutamic-pyruvic transaminase (GPT) were analyzed to identify reliable biomarkers for the presence of cancer. ALDH2 is responsible for the metabolism of ethanol and under expression of the gene has been associated with the development of gastric cancer. Despite the data not supporting the evidence that the mutation was responsible for known stomach cancers in other studies, mutation of the gene has shown statistical significance between the younger ages and onset of stomach cancer ( $p < 0.03$ ). Tissue types commonly seen in cancers with the mutation are skin, large intestine, and prostate, but cancers in the central nervous system saw development 8 years earlier than the average age of onset. AFP is commonly seen during times of rapid cell division and has been used as a confirmation of cancer development. When mutated, the gene enhances anti-apoptotic qualities in immune cells and is responsible for inhibited maturation in immune cells, leading to premature immune cell death. Despite having statistical significance for earlier age of onset for glioma ( $p < 0.0009$ ), the  $n$  value of 12 is too low to consider the analysis reliable. Additionally, the mutations in the gene compose a concerning number of noncoding mutations, leading to the possibility that AFP mutations may be related to other mechanisms in cancer development not currently known. GPT is critical in gluconeogenesis and amino acid metabolism, where mutations may be indicative of cancer. Statistical analysis using T-tests shows significance in gene mutations and development of adenoma and glioma. When looking at tissue types, the central nervous system ( $p < 0.01$ ), large intestine ( $p < 0.05$ ), liver ( $p < 0.05$ ), ovary ( $p < 0.01$ ), thyroid ( $p < 0.01$ ), and upper aerodigestive tract ( $p < 0.05$ ) were statistically significant indicating potential risk increases in cancer occurring in the tissues. Further development of diagnostic measures may allow ALDH2 and GPT to become reliable biomarkers indicative of cancer development. Additionally, more studies may be done to understand the mechanistic role of AFP in other cancers and immune system suppression.

**Kylie Lawson, Tommy Scandura, Ramon Chen, Nijah Simmons, Mauricio Dominguez, Kennedy Kuchinski, Steven Le, Lauren Bennett** (Dr. Wilber Escorcia, Biology)

Alter Hall 304 3:00-3:20 pm

*Morphological effects of caffeine and creatine on Caenorhabditis elegans*

Creatine and caffeine are two supplements widely used by young adults in the U.S. Creatine is important for storing energy and to help fuel muscle contraction. Taken misguidedly as a wonder supplement to boost muscle-building, nonetheless there is promising research outcomes for creatine as a nutraceutical that improves muscle wasting linked to cancer and other chronic diseases. Caffeine is the most used psychoactive stimulant in the world. Increasingly, these supplements are taken jointly to promote fat catabolism while simultaneously increasing muscle anabolism. *Caenorhabditis elegans* (*C. elegans*) are nematode roundworms that are emerging as excellent models of drug effects, particularly those related to development, metabolism, and aging. This is due to their predictable and short lifecycle, high sequence orthology and homology to humans, and their entirely sequenced malleable genome. *C. elegans* represent an excellent model to determine impact of these commonly consumed supplements on growth and development. *C. elegans* were age matched and exposed to 8.75 mM caffeine, creatine, both caffeine and creatine, or a vehicle control for 4 hours during the L1 phase of development. The worms were then allowed to age to the L4 stage, at which point they were immobilized with sodium azide, mounted on slides and photographed using bright field microscopy. The volume of each worm was quantified using imageJ. Worms exposed to creatine had 2.0-fold larger volumes than vehicle control treated animals ( $p = 0.000052$ ,  $n = 149$  vehicle and 97 treated worms). However, worms treated

with caffeine were not significantly different than controls ( $p=0.4$ ,  $n=25$  vehicle and 47 treated). Preliminary data suggest an epistatic interaction between caffeine and creatine, but more data is needed to confirm this interaction. Future directions include quantification of other morphology metrics, quantifying the localization and amount of various lipids, and determining the effects of caffeine and the combination of caffeine and creatine on survival rates of *C. elegans*. Given the prominence of the co-administration of caffeine and creatine it is important to understand the effects of these two compounds on the physiology of growth and development. This work will guide further research in vertebrates and humans on the effects of caffeine and creatine on these variables.

**Megan Maguire** (Dr. Dorothy Engle, Biology)

Alter Hall Poster Session 1 - 2nd floor 2:15-3:00 pm

*A Survey of Halophilic Bacteria in the Tampa Bay Area*

Halophilic bacteria are aquatic organisms that prefer environments with high salt concentrations, commonly found in oceans. Water samples were collected from three different locations in the Tampa Bay area and grown on agar with a high concentration of salt. One strain from each location was selected to submit for testing. They were compared using colony morphology and Gram-stains. Their properties were contrasted using sugar and nitrogen uptake tests, starch hydrolysis, and mannitol salt agar. Their identities were then confirmed using PCR and gel electrophoresis. The investigation concluded that the diversity of bacteria in and around Tampa Bay is abundant.

**Erin Linko** (Dr. Mollie McIntosh, Biology)

Alter Hall Poster Session 1 - 2nd floor 2:15-3:00 pm

*An assessment of aquatic macroinvertebrate structure and function within the Mill Creek Watershed; Cincinnati, Ohio*

The Mill Creek Watershed is an urbanized network of streams that drains through the city of Cincinnati, Ohio. This watershed has had a long history of habitat destruction and pollution due to a variety of anthropogenic factors, namely Cincinnati's combined sewage overflow (CSO) sanitation system. Through an ongoing biomonitoring project at Xavier University, nine sites along the mainstem Mill Creek and three of its tributaries have been studied since 2014. Through habitat assessments, fecal coliform testing, and aquatic macroinvertebrate sampling, the ecological health of this watershed can be tracked over time. The main objective of this research project was to assess aquatic macroinvertebrate structure and function within the Mill Creek Watershed during summer (June-August) 2022. Standardized riffle sampling using a D-frame net and Surber sampler was used to collect quantitative macroinvertebrate samples from benthic riffle habitats ( $n=3$ ) from nine sites within four streams of the Mill Creek Watershed. Structural analyses including Shannon diversity, proportion of tolerant taxa (% Chironomidae), and proportion of sensitive taxa (% EPT) indicate general patterns of higher water quality in upstream locations within individual tributaries as well as across the entire watershed. Functional analyses including relative functional feeding group abundance (% FFG) and ecosystem parameter ratios indicate that the streams studied are largely dominated by gathering collectors, are heterotrophic and lack significant amounts of coarse particulate matter (CPOM). Baseline data from this study in combination with previous years will help managers identify temporal and spatial changes, including potential benefits from ongoing restoration efforts throughout the watershed.

**Emma Sanabia** (Dr. Dorothy Engle, Biology)

Alter Hall Poster Session 1 - 2nd floor 2:15-3:00 pm

*Analysis of Genetic Relatedness of Lonicera maackii within the Greater Cincinnati Area using Microsatellite Loci*

*Lonicera maackii*, Amur Honeysuckle, is a species of invasive shrub that has had disastrous ecological consequences on native forest ecosystems by impacting the survival rates of native flora and fauna. Originating from Asia, *L. maackii* was introduced into the United States as an ornamental shrub in the Eastern United States but has since spread farther westward. Understanding the genomic foundation of *L. maackii* will help inform the techniques used to control the plant by revealing potential vulnerabilities and strengths. Little is known about the genetic sequences of *L. maackii* within the greater Cincinnati Ohio area, although the genetics have been studied in nearby areas of Darke, Preble, and Butler counties in OH. The current study used variations in lengths of microsatellite markers as indicators of genetic diversity. Microsatellites are areas of DNA that contain short repeats; repeat numbers typically vary in a population such that different individuals can have different lengths of a particular microsatellite sequence. From each leaf sample, we amplified three microsatellite loci with fluorescent tags to facilitate exact sizing of each locus. The number of alleles per loci ranged from 11 to 15. The study was conducted on 45 individuals from seven different populations. DNA gel electrophoresis showed that the same fragments within various plants from different regions were distinguishable by length. This study demonstrated the genetic diversity within *L. maackii* plants from around the greater Cincinnati area. The diversity of the plants is ecologically significant and important in understanding the dispersal patterns of *L. maackii*. To better understand the plant's dispersal patterns, future projects should further investigate the extent to which humans opposed to animals contribute to the spread within the greater Cincinnati area.

**Alfredo Rendon** (Dr. William Anyonge, Biology)

Alter Hall Poster Session 1 - 2nd floor 2:15-3:00 pm

*Effect of Jaw Skull Size Variability on Bite Force in Medium-Sized Cats*

In the cat family Felidae, bite force is related to their diet and feeding behaviors. Importantly, their skull and mandibles must have a strong enough bite and resistance to the external forces produced by their prey. Skull morphology can thus be used to determine the morphological differences between felids that specialize on large prey, small prey, or mixed prey. Nine indices that have been shown to reflect functional significance in the skull, jaw, and the corresponding musculature were computed and analyzed from skull and jaw measurements in 5 medium-sized felid species (Cheetah, Puma, Snow Leopard, Clouded Leopard, and Leopard). All measurements were made on various aspects of the skulls from each species using an image processing and analyzing software (ImageJ) and were subjected to statistical analysis. Results indicate that the Clouded Leopard has the strongest bite force which is exemplified by large jaw muscles with high mechanical advantage. The other two leopards (Snow Leopard and Leopard) display relatively high mechanical advantage and, like the clouded leopard, take relatively large prey. However, there is no consistent pattern in similarity of indices among the leopard species in this study. Pumas and cheetahs both have small heads and short snouts with a large zygomatic arch width. The functional significance of the combination of these features in these two species is not clear, but they are known to prey on smaller sized animals such as deer and gazelle, and often lose their kill to larger predators such as lions, hyenas and leopards.

**Emily Slywka** (Dr. William Anyonge, Biology)

Alter Hall Poster Session 1 - 2nd floor 2:15-3:00 pm

*Examining the Relationship between Orbital Convergence Angle and Activity of Modern Primates*

The purpose of this study was to investigate the relationship between the orbital convergence and activity of primates, attempting to additionally propose potential reasons for the noticed trends. In doing so, the theories of primate evolution – including the nocturnal visual predation theory and the arboreal theory of primate evolution – were examined in the context of the results. It was hypothesized that orbital convergence would be higher in nocturnal primates and lower in diurnal primates. The hypothesis was tested by taking measurements of virtual images of dorsally viewed skulls that are housed in the osteology collections at the Field Museum in Chicago, IL and the Smithsonian Institution in Washington DC. The findings did not support the initial hypothesis. Larger diurnal apes and monkeys exhibited the highest average orbital convergences, whereas the small nocturnal lemurs displayed comparatively low orbital convergence. The trend may be due to a failure to account for influence by variables such as body size and postnatal modifications or soft anatomy being a stronger selective force on the skulls.

**Clayton Strege, Rachel Bickett, Gwyneth Hagerty, Caroline Menosky** (Dr. Mollie McIntosh, Biology)

Alter Hall Poster Session 1 - 3rd floor 2:15-3:00 pm

*A preliminary assessment of microplastic pollution in a local watershed of Cincinnati, Ohio, prior to reservoir dredging*

Microplastics, defined as small particles of plastic between 2 and 5  $\mu\text{m}$ , are a pressing environmental concern due to the growing use of plastic products and subsequent disposal. While most microplastic research has focused on marine systems, a growing concern exists on the presence of microplastics in freshwater systems and additional impacts to humans and wildlife. The main objective of this preliminary study was to assess the prevalence of microplastics in water surrounding a dammed reservoir. These results will provide baseline data to assess the role of dam dredging on microplastics. Samples were taken from Sharon Woods Park, Cincinnati, Ohio, in October 2022, from three stream sites on Sharon Creek (upstream of the reservoir, immediately downstream and further downstream of the dam) and two sites on Sharon Lake (immediately above the dam and middle edge). Water samples ( $n=5$ ) were collected in glass Mason jars below the water's surface at each site. Two control samples were also obtained at each site by holding open jars above the water's surface for 15 seconds. Field samples were filtered and examined using a dissecting microscope. Microplastics were identified and quantified by type (fragments, fibers, pellets, foams, and films). Filtered deionized water, deionized water, and tap water were also used as laboratory controls. If time permits, Nile red dye staining will be utilized in fluorescent spectroscopy. Microplastics were present at all sample sites, including both stream and lake sites. Preliminary results indicate the most abundant types of microplastics in the samples were fibers and fragments.

**Alisha Yerovi** (Dr. Ann Ray, Biology)

Alter Hall Poster Session 2 - 2nd floor 4:00-4:45 pm

*Identifying Chemical Attractants of Click Beetles (Coleoptera: Elateridae)*

Click beetles (family Elateridae) occupy a variety of niches. The larvae of most species are saprophagous, while some are predatory, and others feed on the roots of living plants. These click beetle larvae, referred to as wireworms, can damage crop plants, making them serious agricultural pests that are



difficult to control and monitor. The ability of adult elaterids to register and respond to chemical signals, including pheromones, can be exploited for management and conservation purposes. Until recently, however, most studies of click beetle pheromones were limited to Eurasia. We tested the effectiveness of seven potential attractants when applied to black panel traps at a site in Clermont Co., Ohio. Our results indicate that one of the compounds, neryl hexanoate (NH), may be an attractant of *Glyphonyx ferruginosus* (Schaeffer, 1916). Additional work is needed to determine the role of NH in the biology of this species.

**Zach Wilson** (Dr. William Anyonge, Biology)

Alter Hall Poster Session 2 - 2nd floor 4:00-4:45 pm

*Limb Proportions and Locomotor Behavior in Medium-sized Cats*

Click beetles (family Elateridae) occupy a variety of niches. The larvae of most species are saprophagous, while some are predatory, and others feed on the roots of living plants. These click beetle larvae, referred to as wireworms, can damage crop plants, making them serious agricultural pests that are difficult to control and monitor. The ability of adult elaterids to register and respond to chemical signals, including pheromones, can be exploited for management and conservation purposes. Until recently, however, most studies of click beetle pheromones were limited to Eurasia. We tested the effectiveness of seven potential attractants when applied to black panel traps at a site in Clermont Co., Ohio. Our results indicate that one of the compounds, neryl hexanoate (NH), may be an attractant of *Glyphonyx ferruginosus* (Schaeffer, 1916). Additional work is needed to determine the role of NH in the biology of this species.

**Paige Loboschewski, Emma Weiss and Addyson Thomas** (Dr. Mollie McIntosh, Biology)

Alter Hall Poster Session 2 - 2nd floor 4:00-4:45 pm

*Pre-dredging assessment of aquatic macroinvertebrates from Sharon Lake and Creek, Cincinnati, Ohio*

Dams can serve a multitude of purposes for humans including water storage and flood control. However, dams can also have negative cascading impacts on the surrounding ecosystem. One impact is sedimentation, where reduced water flow can increase the accumulation of benthic sediment. Nutrients can also accumulate leading to eutrophication, affecting organismal and ecosystem health. In order to improve water and ecosystem quality, dredging can occur to remove benthic sediments. The main objective of this study was to characterize the macroinvertebrate community above and below a dam prior to substrate dredging. This study was conducted in Sharon Lake and Creek near Cincinnati, Ohio, in fall 2022, before dredging activities in 2023. Macroinvertebrates were collected at three stream sites, one upstream and two downstream of the dam, and two wetland sites, both upstream of the dam in the reservoir. All macroinvertebrate samples were sorted and identified to family level, and functional feeding groups were assigned. Multiple macroinvertebrate attributes were calculated to assess baseline conditions before dredging and to compare post-dredging impacts over multiple years. Preliminary stream results indicate higher macroinvertebrate abundance and lower evenness upstream compared to downstream. Upstream samples were dominated by Hydropsychidae (Trichoptera) and Chironomidae (Diptera). Wetland samples had higher diversity, including more Crustacea and Mollusca. Overall, this study will provide park and project managers insight into dredging impacts and help in future management and restoration efforts in this watershed.

**Rebecca Gathof** (Dr. William Anyonge, Biology)

Alter Hall Poster Session 2 - 2nd floor 4:00-4:45 pm

*Prey and Diet - Related Differences in Craniodental Morphology and Jaw Mechanics Among Five Species of Canids*

As members of the order carnivora, the majority of species in the dog family, Canidae, are predators. All predators rely on strong skulls, jaws, and teeth to kill and dismember their prey. Killing techniques, however, may differ depending on preferred prey. Consequently, differences among carnivorous species in killing and feeding behavior are evident in the morphology and biomechanics of their skulls and teeth. This study aims to compare several skull and mandibular features as well as aspects of jaw mechanics among five extant canid species, the gray wolf (*Canis lupus*), coyote (*Canis latrans*), Red fox (*Vulpes vulpes*), Golden jackal (*Canis aureus*), and African hunting dog (*Lyacon pictus*), to determine if there exist mechanical loading differences in the skull and jaw based on size of prey and/or composition of diet consumed. Several indices that estimate loading patterns and size of jaw muscles were computed from 11 dry skull and jaw measurements taken on each species. Statistical analysis on the indices indicate that the African hunting dog (*L. pictus*) and gray wolf (*C. lupus*) have significantly larger masseter muscles and larger mechanical advantage for the same muscle for food items placed at the first and third lower molar compared to the other 3 species (golden jackal, coyote, and red fox). The African wild dog is an opportunistic predator that hunts a wide variety of prey including antelopes, warthogs, and wildebeest calves. The preferred prey for gray wolves includes caribou, moose, deer and bison. These two predators frequently hunt and kill prey that are often larger than themselves compared to the other three species that display smaller jaw muscles and weaker bite forces consistent with their omnivorous diet comprised of mostly small mammals, insects, and a variety of plant material such as fruits and nuts.

**Joy Bowling, Sara Dipnarine, Kaleigh Falimirski, Jensyn Goss, Felicity Kelsch, Alex Keta, Ella Newton, Lindsay Rowland, Emma Welsh, Sophia Willis** (Dr. Kathryn Morris, Biology)

Alter Hall Poster Session 2 - 2nd floor 4:00-4:45 pm

*Tardigrade Chemotaxis*

Tardigrades are often thought to be lumbering organisms that are not capable of seeking out nutrients or demonstrating chemotaxis, the movement of an organism in response to a particular substance. We suspected that tardigrades possessed the ability to recognize foods and poisons and to move up or down concentration gradients appropriately. We constructed testing arenas and established a concentration gradient of variable substances and observed tardigrade movement in the arena. The tardigrade movement was filmed and digitized to quantify chemotaxis patterns. We tested multiple substances including expected attractants and repellents. Patterns were inconsistent, but trends suggest that tardigrades can sense and respond to chemical signals in their environments. Movement away from repellents was more pronounced than movement toward attractants. We are continuing to optimize our arena design in ongoing research, and eventually plan to monitor chemotaxis *in situ* in more realistic environments.

**Ryan Zimmerman, Shayne Skrtic** (Dr. Dorothy Engle, Biology)

Alter Hall Poster Session 2 - 2nd floor 4:00-4:45 pm

*The Effect of Pseudomonas putida and Klebsiella oxytoca on The Breakdown of Caffeine and Ketamine*

With the increase in chemicals being found in our environment, we need to look for ways to break down the chemicals in our environment and in ourselves. Two of some of the many chemicals in our environment are caffeine and ketamine, which have seen an increase in consumption and being leftover

the environment in the last couple of years. Caffeine and ketamine are both broken down by N-demethylation pathways. Although some bacterial species can break down caffeine so far, no studies have shown that any bacteria can break down both. First, we searched databases for bacteria with gene systems (operons) for the breakdown of caffeine. We found that bacterial species, *Pseudomonas putida* and *Klebsiella oxytoca*, both have a similar operon for the breakdown of caffeine. We also chose these species because *Pseudomonas putida* is an environmental bacterium, while *Klebsiella oxytoca* is found in humans. Since there is a lack of research in this field of study, this project focused on developing methods to assess the ability of the bacteria to use caffeine and ketamine as nitrogen sources. The protocol established throughout this experiment starts with frozen cell stocks, to recovery from freezing, then transition to experimental media, and finally a method to assess cell growth over time. There have been an initial 3 trial runs and future studies will use this protocol to collect data over multiple replications of this experiment. Overall, the data will hopefully show that the two species of bacteria can both breakdown caffeine and ketamine by N-demethylation pathways.

**Katie Thiel** (Dr. William Anyonge, Biology)

Alter Hall Poster Session 2 - 2nd floor 4:00-4:45 pm

*The Genetic Basis of Tooth Size Differences in Cavefish*

The Mexican tetra (*Astyanax mexicanus*) fish consists of two interfertile forms: the sighted surface-dwelling morph and the blind cave-dwelling morph. When comparing the two morphs, the cavefish has acquired many distinct traits that are tailored to life in total darkness, while the surface fish embodies phenotypes similar to those of other river-dwelling species. Both forms are tractable laboratory species, allowing for genetic experimentation aiming to understand the genes underlying the evolution of morphological changes. Previous studies have identified genetic associations between regions of the cavefish genome and craniofacial phenotypes, including tooth size differences between surface and cavefish. Toward that end, we set out to discover the gene/s involved in determining tooth size and shape during development. The genes within the target region were first investigated using the genomic database Ensembl for their Gene Ontology terms, which provided information on the molecular function, biological processes, and cellular components for each gene. I surveyed 21 genes for genetic mutations using sequences extracted from natural populations in Mexico using a threshold of a 75% sequence difference or greater coupled with a significant amino acid change (nonsynonymous polymorphism). From the sequences that met the criteria, we designed genetic primers and performed PCR to amplify genetic sequences. Our PCR products were submitted for DNA sequencing and analysis. These sequences were then aligned to the *A. mexicanus* genome to determine if the mutations were present in our laboratory populations. Results showed that there are currently two confirmed mutations in the genes *rnf32* and *en2a* on Chromosome 16. Future work will seek to further characterize the roles of these genes to tooth development using *in situ* hybridization. Ultimately, transgenic fish will be generated to determine the functional role of candidate genes in tooth development. The work produced by this project provides insight into how the Mexican tetra is an excellent genetic model for studying tooth development, and will continue to be valuable in other facets of evolutionary exploration.

**Kaleigh Falimirski, Justin Groskopf, Alex Keta** (Dr. Kathryn Morris, Biology)

Alter Hall Poster Session 2 - 2nd floor 4:00-4:45 pm

*Survey of Tardigrade Diversity in Cincinnati, OH*

This study was performed to assess tardigrade (Tardigrada) diversity in the localized Cincinnati area of Xavier University in response to a shortage of similar studies in recent years. It was expected to find a wide variety of genera and species in predominantly moss samples along with auxiliary tardigrades in lichen. Collections of moss and lichen were obtained from Xavier University with a variety of heights above ground level, types of tree, specific locations, and cardinal directionalities. Results indicate that tardigrade concentration was highest in lichen samples as opposed to moss, and tardigrade genera and species diversity was lower than projected; the species *Macrobiotus hufelandi* was most bountiful in comparison to other genera and species. Although outdated, the most recent study done in 1986 also supports the finding of *Macrobiotus hufelandi* as the most common species in the area. In future studies, we will expand our survey area and continue to monitor tardigrade diversity in the immediate area.

**Lance Kuo-Esser, Julia Driggers, Paul Pierce** (Dr. Wilber Escorcía, Dr. Adam Bange, Dr. Hanna Wetzel, Biology and Chemistry)

Alter Hall 211 3:00-3:20 pm

*HPLC method for quantification of creatinine and ketamine in C. elegans: A novel approach for studying excretory function and drug metabolism*

*Caenorhabditis elegans* (*C. elegans*) represent an excellent model organism of human pathology, physiology, and pharmacology. Much of the *C. elegans* genome and proteome are conserved in higher organisms, including humans. Creatinine is a waste product generated by muscles as they break down creatine, which is a molecule involved in energy production. In humans, creatinine output is used clinically to measure glomerular filtration to determine kidney function. In *C. elegans*, creatinine output could be used as a model of overall excretory function in these animals to inform pharmacokinetic studies done in this model. Ketamine is a dissociative anesthetic that has recently been approved for treatment resistant depression. It is important to fully characterize the pharmacokinetics of this drug throughout development and identify factors that may impact its metabolism. We therefore aim to use *C. elegans* as a model organism to study the pharmacokinetics of ketamine by measuring creatinine output and the breakdown of ketamine. The first step towards this goal is to develop robust analytical methods for both ketamine and creatinine in these animals. We report on a simple dilute-and-shoot high performance liquid chromatographic (HPLC) method for the quantification of creatinine output and ketamine degradation in *C. elegans*, without the need for precolumn derivatization or use of mobile phase buffers. Chromatographic separation is obtained using a C18 column and isocratic mobile phase of 80:20 (H<sub>2</sub>O, acetonitrile and 0.1% formic acid), at a detection wavelength of 233 nm for creatinine and 210 nm for ketamine with a runtime of 4 minutes. A calibration curve of ketamine was generated with an R<sup>2</sup> of 0.97 in triplicate with a linear range of 5 µg/mL to 3000 µg/mL. A calibration curve of creatinine was generated with an R<sup>2</sup> of 0.95 in triplicate with a linear range of 2.5 µg/mL to 3000 µg/mL. This creatinine method showed minimal matrix effects when used to detect creatinine in *C. elegans* media after 12 hours of worm incubation. Accumulation of creatinine in the worm solution can be seen increasing until a plateau at 12 hours when worms in the sample tube died. In the future, this method will be used to study the clearance pharmacokinetics of ketamine by measuring ketamine degradation while simultaneously quantifying overall excretion rates of creatinine output.

**Emmitt Hoying** (Dr. Alan Jin, Business Analytics)

Alter Hall Poster Session 1 - 2nd floor 2:15-3:00 pm

*How Has the COVID Pandemic Impacted Students and their Career Goals*

This study explores the impact of the recent pandemic and how it's affected students going into the workforce. We've done surveys and interviews with junior and senior students from a variety of schools all across Ohio. Our questions were focused on topics surrounding mental health, impact on learning skills, and changes in career paths.

For the surveys and interviews, we narrowed our questionnaire to three questions. We wanted to know how the pandemic has impacted a students' learning/skills, opportunities & difficulties, and whether or not their intended career path had changed due to COVID. We also collected other background information including the students' year, major, university, and how their classes were taught during the pandemic. Lastly, we asked questions about their confidence and whether or not their universities were properly setting themselves up for success.

Our initial findings came from our own first-hand surveys. Based on the schools we gathered from information, these findings only apply to Ohio junior and senior college students. The questionnaire was designed to see how the pandemic positively or negatively impacted particular student groups. One of our initial findings is how a lack of hands-on learning skills forced students to learn a separate new set of skills all together. For instance, students in some majors such as biology and chemistry felt pressure to switch majors as a result of losing that traditional style of learning. While other majors such as computer science said that the change had actually helped a lot more. Another initial finding is that the greatest difficulty moving back to regular in-person classes was interacting with people again. Changes in students' learning environment certainly impacted performance, but the biggest hurdle was relearning to use social skills again. Simply being around other people again would never be the same. Even after being told to resume school as it once was, people were still hesitant to interact with one another.

**Mairead Harris** (Dr. Ronis-Tobin, Center for Population Health/Biology)

Alter Hall Poster Session 2 - 2nd floor 4:00-4:45 pm

*Avoiding a Climate Crisis in Cincinnati Schools: Assessing Associations between School Climate, School Safety and Student Mental Health Outcomes within the Context of an Authoritative Model*

The COVID-19 pandemic exacerbated existing alarming trends in youth mental health (CDC, 2020; Kalb et al., 2019; Reinert, Fritze, and Nguyen, 2021). In 2021, the United States' Surgeon General declared a state of national emergency in youth mental health, making essential recommendations for intervention in the institutions most proximal to the lives of young people, like the school (US Department of Health and Human Services, 2021) (US Department of Health and Human Services, 2021). Authoritative School Climate Theory (ASCT) is a framework for analyzing the effects of the school environment on scholastic, behavioral, and psychosocial outcomes for students (Cornell et al., 2016). Findings of the present study indicate that students' mental health outcomes are significantly ( $p = 0.000$ ) associated with perceived feelings of support ( $r = 0.605$ ), structure ( $r = 0.187$ ), and safety ( $r = 0.305$ ) from peers and teachers at school. The study provides support for the inclusion and expansion of authoritative school climate items in subsequent scholastic assessments, and projects that data collection over time can aid in instituting authoritative school climate-based interventions to ameliorate current trends in youth mental health in Cincinnati schools (MHA, 2022; Morrison, Furlong, and Morrison, 1994; Ohio State Legislature, 2021).

**Sofia Gholston-Green** (Dr. Stephen Mills, Chemistry)

Alter Hall Poster Session 1 - 2nd floor 2:15-3:00 pm

*Characterization of Proteins in the FUR regulon*

The Ferric Uptake Regulator (FUR) is a transcriptional repressor found in many bacterial species. The FUR regulon has been determined for *E. coli*, *Shewanella oneidensis*, and *Pseudomonas aeruginosa*. In each of these species, FUR was found to regulate about 100 proteins total, most of which are involved in iron uptake in some way. However, about 30 proteins in each species did not have an identified function at the time of the publication. In this project, we wanted to assign function to as many of these unknown proteins as possible. Since the time of the regulon papers, some of those unknown proteins have been further characterized, but several remain uncharacterized. For these proteins, we used tools from the BASIL curriculum to predict their functions. The BASIL curriculum uses a series of modules that use bioinformatic methods to compare the structure and sequence of unknown proteins with proteins of known function. These modules use programs such as SPRITE and Dali to compare active-site structure and overall protein structure (respectively) with other proteins. BLAST and Interpro are used to perform sequence analyses of the candidate proteins. With functions predicted for some of the proteins in the FUR regulon, future work will focus on obtaining those proteins to test our predicted functions.

**Madyson Briggs** (Dr. Stephen Mills, Chemistry)

Alter Hall Poster Session 1 - 2nd floor 2:15-3:00 pm

*Identification of a new serine hydrolase*

Of the over 10,000 proteins that were crystallized and deposited into the Protein Data Bank during the Protein Structure Initiative, roughly 30% of them remain without a defined function. In this project, the functions of these proteins are assigned using a combination of *in silico* and wet-lab techniques. Computational tools are used to generate a preliminary hypothetical function for the protein. Following the BASIL curriculum, SPRITE is used to identify an arrangement of amino acids with a known function. BLAST and Pfam are used to compare the sequence of the new protein with known sequences. DALI compares the overall structure of this protein with other proteins of known function.

After generating a reasonable hypothesis of likely protein function, this hypothesis is tested using wet-lab experiments. Expression clones for the protein were obtained from the DNASU repository and the protein was expressed and purified using Ni-affinity chromatography. Docking experiments using SwissDock were used to identify potential substrates for kinetic analysis. Enzymatic activity of the new protein with the substrate identified by docking confirms its function.

**Anna Davis, Andrew Lim, Sophia Romero** (Dr. Stephen Mills, Chemistry)

Alter Hall Poster Session 2 - 2nd floor 4:00-4:45 pm

*Identification of Novel Metalloproteases*

Approximately thirty percent of identified proteins do not have a known function. In order to determine the function of these proteins, programs like the Biochemistry Authentic Scientific Inquiry Lab (BASIL) are utilized. The BASIL program is divided into several different modules which allow the comparison of structure and sequence of proteins with known functions with a protein of unknown function. SPRITE, Chimera, and Dali are used to compare protein structures and to match proteins based on the

similarities of their structures. The computer programs BLAST and Pfam (now called InterPro) are used to compare the sequences of proteins and find sequence alignments.

Originally the BASIL program was assembled to identify novel serine hydrolases, but it can also be used to identify other classes of enzymes, such as metalloproteases. When looking at the structures of metalloproteases a specific motif was identified for further investigation. A motif is an arrangement of conserved amino acid residues that are important for a protein's function. The motif that is present in almost all metalloproteases is the HEXXH motif. By using this motif, candidate proteins were identified and evaluated as potential novel metalloproteases. These metalloproteases will be characterized further using the BASIL modules.

**Isa Baldwin Zurek** (Dr. Supaporn Kradtap Hartwell, Chemistry)

Alter Hall Poster Session 2 - 2nd floor 4:00-4:45 pm

*Paper Chromatography: Application for Quantitative Analysis*

Thin layer chromatography (TLC) is a common separation technique used to determine the composition of samples. It is widely used because it is generally inexpensive, fast, and requires little sample preparation compared to other separation techniques. The downside of TLC is that in order to identify the chemical components, the R<sub>f</sub> values typically need to be measured soon after separation has completed, and before colors of the components fade away. In addition, TLC is a primarily qualitative technique which requires more complicated steps if quantitative analysis of components is desired. This includes scraping the analyte spot and dissolving it in a suitable solvent for further analysis with other techniques. This research aims to overcome the limitation of time constraint in analyzing the separation results by taking a digital image of the TLC plate. This enables data analysis of R<sub>f</sub> values to be done at a later time and the original separation results can be kept for second opinion, if needed. Digital image will also allow expansion of TLC application to quantitative analysis. Here, RGB values will be examined to see how they correlate to concentration of the substance of interest. Precise sample introduction methods e.g. using a micropipette or a small scale gas chromatography syringe, will also be evaluated.

**Rutherford Allison** (Dr. Shannon Byrne, Classics and Modern Languages)

Alter Hall 302 3:00-3:20 pm

*The Development and Adoption of the Codex*

In my thesis, I examine the development and adoption of the codex as a form of book, exploring why the codex was able to replace the scroll in only a few centuries. In my first chapter, I examine the development and early uses of the codex format. The codex descends from the wooden tablet and parchment notebooks, and I examine the uses of these and how they impacted the adoption of the codex. I then look at early uses of the codex, particularly Martial, who provides the earliest mention of the codex. In the second chapter, I discuss why Christians took up the codex, as their usage stands apart from all other groups in the ancient world, and how a unique Christian literary culture helped to facilitate the spread of the codex. In the final chapter, I explore how the codex spread in the third and fourth centuries, both through the expansion of Christianity and through new non-Christian users. In this section, I also detail the practical advantages of the codex, which are key to its adoption.

**Lin DeGraaf, Haley Morgan** (Dr. Thomas Wagner, Communications)

Alter Hall 304 3:20-3:40 pm

*The Era of Intolerance: Cancel Culture and Tolerance for Disagreement on Instagram*

The original tolerance for disagreement (TFD) measure sought to determine the level at which individuals can handle conflict (Tevin, Richmond, McCroskey, 1998). Previous studies and literature surrounding tolerance for disagreement suggested that future research could examine if tolerance has changed over time. Also, if TFD is exacerbated by social media. In addition, research suggested that certain factors on social media could predict the level to which an individual would tolerate an alternate opinion. This study expands upon the original TFD measure and modifies it to fit the social media platform, Instagram. A study was conducted to revise the TFD measure for use on Instagram. Participants offered suggestions for revision in focus groups and recorded changes to an activity sheet to revise the measure. The scale was modified to see if certain behaviors on Instagram, such as blocking or unfollowing, were associated with a lower tolerance for disagreement.

**Morgan Miles** (Dr. Renea Frey, English)

Alter Hall 206 3:20-3:40 pm

*Disability's Place in the College Institution's Codified Composition*

This study, in exploring the intersectionality of disability studies and composition in the classroom, investigates how educational policy regarding disability shapes students' rhetoric and attitudes towards people with disabilities and towards the school they attend. Surveys inquire on the student's perspective of the effectiveness of disability services or their peers' access to disability services, as well as the students (disabled and non-disabled) perception of how inclusive a campus is versus how inclusive the rhetoric (on campus, in syllabi, through services, in writing) surrounding disability is. Syllabi on two different college campuses, alongside the surveys, contribute to the study's analysis by comparing the student experience or perception of a campus's disability inclusivity practices with the breakdown and measurement of educational policy and how disability inclusive (or not) it is. A disparity in the student experience compared to the codified disability-inclusive (or non-inclusive) policy is an indicator of a college institution's ability, efforts, or lack thereof, to address the needs of students with disabilities through composition. Furthermore, student perception that doesn't match up with how inclusive or non-inclusive educational policy is is an indicator of the composition of a college institution's impact on how student rhetoric and attitude towards people with disabilities may be shaped.

**Grant Connely** (Dr. Renea Frey, English)

Alter Hall 207 3:00-3:20 pm

*How can we better prepare students for College level writing?*

My project is about how preparing students in high school for college writing affects their readiness for their first papers. I believe this is important research because it can help determine if there is a problem, and how to solve said problem. I hope to find a correlation between preparation for students in high school and their grade on their first paper(s) in college. I plan to collect data from a short survey asking if they were taught MLA format in high school, if they felt prepared going into their first paper, and if they are comfortable, the grade they received on their first paper.

**William Morcillas** (Dr. Renea Frey, English)

Alter Hall 208 3:00-3:20 pm

*Professional Correspondence Research Study*



Professional correspondence is crucial on the workplace level in its succinct communication of information. This paper is a study into the impact of professional writing studies on the quality of such correspondence. I situate my research that was performed for this study within the bounds of workplace writing from both scholarly and popular sources. To test my hypothesis that trained writers will outperform untrained writers, I will review individual responses from professional writing students and non-students on both qualitative and quantitative bases.

**Kalyn Obermeyer** (Dr. Renea Frey, English)

Alter Hall 211 3:20-3:40 pm

*Showmanship and Student Engagement: Creative Writing Experience's effect on the overall student perception of teachers*

Academic discourse surrounding Creative Writing Pedagogy is largely dominated by arguments as to why creative writing is worth teaching to our students, what benefits it grants to their writing skills overall, even beyond the sphere of Poetry, Fiction, and Creative Nonfiction. This speaks to the overall issue perceived by academics in this field—those who control what kind of writing instruction students are given mandatorily and those who determine what kind of English/Language Arts instruction is included in standard curricula are in need of persuading as to why more creative writing instruction ought to be included. One of the key claims in favor of creative writing instruction I've seen repeated again and again is that creative writing instruction sharpens other language arts skills as well. In light of this, I've conducted a study intending to determine whether having received creative writing instruction and/or having tangible experience in publishing pieces of creative writing makes for better writing professors overall. The purpose of this analysis is to determine if there is a clear correlation between a writing professor's creative writing qualifications and their overall scores on Rate My Professor, as well as the number of ratings they received overall.

**Tessa D'Errico** (Dr. Renea Frey, English)

Alter Hall 302 3:40-4:00 pm

*Student Attitudes Toward Creative Writing Pedagogy*

In this research paper and its corresponding presentation, I seek to uncover student attitudes toward creative writing pedagogy and how those attitudes may influence how creative writing should be taught in pre-college classroom settings. To answer this question, I created and sent a survey with opinion based questions concerning student attitudes to creative writing. The benefits of this research include improving methods of teaching creative writing based on student feedback and centering creative writing on benefits for students.

**Nina Benich** (Dr. Renea Frey, English)

Alter Hall Poster Session 1 - 2nd floor 2:15-3:00 pm

*A Statistical Analysis of Female Writers' Popularity and Impact on Students in High School and College Literature Classes*

Women in literature have increasingly become more and more supported in fields of education over recent years. Female authors such as Jane Austen and Mary Shelley seem quintessential to the basic English curriculum, both in high school and college. Yet, a substantial amount of research has not yet

been done to determine which of these female authors are most well-received by students, and the reasons for this. In order to determine which female authors have the greatest educational impact on students, this research will first examine which female authors are most commonly taught in high school and college literature courses. I performed a statistical analysis on the information obtained from a survey of Xavier students in order to respond to these questions. My research looks at how favored female authors are among teachers and students, as well as how effectively their writing fosters critical thinking, empathy, and cultural awareness. My findings indicate that, despite the fact that some female writers are taught more frequently than others, the impact these writers have on students differs depending on a variety of elements, such as the author's cultural background, the genre, and the time period of their writing.

**Alyssa Dixon** (Dr. Renea Frey, English)

Alter Hall Poster Session 1 - 2nd floor 2:15-3:00 pm

*Educators of Color: Is Diversity in the Classroom Vital to Students' Success?*

Within a significant majority of classrooms across the United States, the absence of diverse educators within school educators is a large concern for students' success and achievement. Previous research has revealed that increasing educators of color creates benefits for **all** students in terms of academic success and classroom comfort. Previous data also demonstrated the large difference in numbers between white educators versus educators of color, with white educators dominating the teaching field. For my research project, I hope to address the benefits of having scholars of color in front of classrooms and [offer] possible alternatives to recruit more educators of color, and emphasize the importance of diversity for students.

**Johanna Petrik** (Dr. Renea Frey, English)

Alter Hall Poster Session 1 - 2nd floor 2:15-3:00 pm

*Examination of effectiveness of Universities' teaching strategies for ESL*

While researching ESL for another assignment, I learned that many schools are ill prepared to support these students. I also learned that Xavier had a program for them in the past, and does not anymore. This brought me to wonder why many schools are not providing accessibility to their ESL students and what could be some improvements that could be added to teaching that will be easy for Universities. I hoped to discover ways in which improvements can be made in a easy and seamless way to help provide more support for ESL students. I am collecting my data from online sources and am looking at different University programs for ESL students. I hope to find ways in which Schools can better support ESL students and find teaching strategies or courses that can be added to better help these students in their learning.

**Renee Maloney, Kyra Hudson** (Dr. Renea Frey, English)

Alter Hall Poster Session 1 - 2nd floor 2:15-3:00 pm

*Gender Gap in Compositional Studies*

Following the continuous oppression of girls and women's education, there lies a gender gap. This gap comes in many forms with things as simple as tone and word being used to indicate just how large this gender gap is when viewed through the lens of educational effectiveness. There have been numerous studies conducted on gender bias that is perceived in an educational setting and what factors lead to

this widespread bias. This same gender bias is also seen universally throughout the writing profession when comparing the number of women in the profession to the number of women writers that are having their work seen. It is especially highlighted when looking at the number of writers that are being pushed to the masses through print and online media. This gender gap raises many questions regarding the way that women and girls are perceived in society and whether or not this perception changes the way that women and girls write throughout their lives.

**Hannah Jawed** (Dr. Renea Frey, English)

Alter Hall Poster Session 1 - 2nd floor 2:15-3:00 pm

*Disability Studies in Higher Education Institutions*

This project seeks to investigate how students with disabilities are accommodated in higher education institutions. Through research on theoretical frameworks within disability studies, various higher education institutions' curricula, and different approaches to disability inclusion, I have found that higher education institutions' inclusivity of students with disabilities has increased in recent years and that there are no downsides to this inclusion. To examine this, I have synthesized this data to illustrate the experiences of students with disabilities and suggest further actions for improving inclusivity. Allowing equal opportunities for all students in the field of education enriches our society and promotes inclusivity on all fronts.

**Maddie Agresta** (Dr. Renea Frey, English)

Alter Hall Poster Session 2 - 2nd floor 4:00-4:45 pm

*Integrating Sustainability Topics Through Transdisciplinary Learning*

Sustainability is a really important issue that affects everyone on the planet but is not talked about nearly enough. Students are not being taught in depth about sustainability, what it is, and why it's important. I think that it's essential to provide students with facts and practical solutions about sustainability. This could help to positively impact future generations to make more sustainable decisions as an entire society. Conducting this research to display an interest and a need for it as well as what it could hypothetically look like in a classroom is an important step in making it a reality. I conducted a survey based on potential methods of integrating sustainability in composition to gauge what students showed the most interest in to try to find what would be most effective in a classroom. The goal of my study is to see not only how to teach sustainability but how to teach it in a way that gets students interested and care about the topic.

**Justin Malone** (Dr. Renea Frey, English)

Alter Hall Poster Session 2 - 2nd floor 4:00-4:45 pm

*Investigating Student Perceptions on the Effects of Contemplative Practices in Classrooms*

As universities face many challenges using the common pedagogical approaches that have shaped higher education, new alternative practices have been applied to effectually foster student learning amidst the growing complexity of the educational landscape. In these settings, contemplative practices have emerged as a prominent instructional method that allows students to cultivate deep awareness, insight, focus, and connection with complex ideas through participating in introspective exercises and contemplating content. While the benefits of several aspects of contemplative approaches have been

clearly recognized, a substantial amount of research has not yet analyzed university students' perceptions of this learning environment and how they feel specific approaches impacted them in their studies and writing abilities. To determine the impact of contemplative practices in undergraduate classrooms, this research statistically and qualitatively analyzed students' preferences and attitudes towards these approaches using a survey answered by randomly selected undergraduate students at Xavier. Quantitative results showed specific trends in student perceptions of using mindfulness exercises, reflective writing and journaling, close reading, deep listening, and dialogue. Qualitative results also showed increased engagement with multiple viewpoints and others, calmness in classroom spaces, and concentration on content and writing that can inform future instruction.

**Christian Spearman** (Dr. Renea Frey, English)

Alter Hall Poster Session 2 - 3rd floor 4:00-4:45 pm

*Project-Based Learning – Responding to Social Justice Issues in a Writing Classroom*

Each school year, students and teachers alike anticipate the overwhelming pressure of standardized testing. Not only have educators argued for years that standardized tests can not accurately assess a student's full capabilities, but students dread the boredom associated with standardized testing content and procedures. This research paper seeks to discover how writing teachers can move beyond such rote assessments in their classroom by incorporating project-based learning (PBL) into their curriculum. Project-based learning is an instructional method designed to give students an opportunity to build skills and content understanding by engaging in projects that may be applicable to real-world situations. Perspectives about project-based learning and community collaboration were generated using quantitative data collected through survey responses and peer-reviewed public data. To guide this study, the main question sought to answer was: *How can students use project-based learning in a writing class to respond to social justice issues in their community?*

**Lauren Sholtis** (Dr. Renea Frey, English)

Alter Hall Poster Session 2 - 3rd floor 4:00-4:45 pm

*The Effect Poverty Has on Education*

The rising presence of poverty rates has a grave effect on students and their school performance. There has been extensive research on the topic supporting the causation of poverty rates negatively impacting the student's school experience and their academic success. This study investigates the perspective of teachers and school employees to understand how they see the effects of poverty in their classrooms, using survey methods to investigate the perspective of teachers and school employees. This data has shown how poverty rates affect students and their ability to have success in the classroom. Furthermore, this study aims to highlight the effects of poverty on the future lives of these students.

**Molly Dynda** (Dr. Renea Frey, English)

Alter Hall Poster Session 2 - 3rd floor 4:00-4:45 pm

*The Value of Publishing Student Writing*

This paper researches the idea of publishing student writing, a concept valued highly in feminist pedagogy. In attempting to understand the full scope of it, I wanted to answer the question of how valuable it was to composition studies and how to incorporate it into more composition classes.

Previous research I found all leaned in favor of using publishing writing to enhance student's writing abilities. They focused on how it increases students' engagement with writing and with the class, improves basic grammar and writing skills, and is a useful tool in teaching English as a second language. To gather more information, I sent a survey to English professors to answer, as well as a student survey. I focused on questions about engagement and learning, if they had encountered an assignment where their writing was published, and if the professors had been taught to include assignments like this while they were earning their degree. As of now, results are showing that many students appreciate assignments where their writing is seen outside the classroom and that publishing student writing proves valuable.

**Marty Dubecky** (Dr. Renea Frey, English)

Alter Hall Poster Session 2 - 3rd floor 4:00-4:45 pm

*Meditations on Writing: Contemplative Pedagogy in the Writing Classroom*

Contemplative Pedagogy is a relatively new form or method of teaching in which mindfulness is at the priority. Contemplative Pedagogy focuses on the student and their mental and emotional well-being as well as their connection to their mind and body. The idea of the pedagogy is for the student to connect themselves deeper with the subject they are learning. In the writing classroom this is pertinent because of the shifting ideology of education and the role of the student. In this poster, an overview of the field of Contemplative Pedagogy will be discussed, as well as how it specifically applies to the writing classroom. Research about the efficacy of this pedagogy and which practices aid particularly in the writing classroom will be shown and described. Research and data come from various other scholarly academic journals pertaining to Contemplative Pedagogy. The various pedagogical practices and how they are applied into the writing classroom will be showcased with the accompanying data.

**Luke Sablotny, Lucas Houk** (Dr. David Hyland, Finance)

Alter Hall Poster Session 1 - 2nd floor 2:15-3:00 pm

*D'Artagnan Capital Fund*

For our undergraduate research, we are discussing the student-led investment fund, known as the D'Artagnan Capital Fund (referred to as The Fund). Attached to this document is a photograph of a potential presentation board which depicts the rigorous research process that The Fund undergoes every semester with each new cohort. The Fund is a two-class finance capstone, with class one offering analyst roles for The Fund, and class two offering C-Suite and Managerial roles. The Fund manages a \$5 million dollar portion of the Xavier University endowment; yes, real money managed by students. We research and invest in large cap equities through our rigorous bottom-up approach.

The Fund utilizes an active management approach, meaning that we are always buying and selling stocks based on our research. Our research process involves model building to estimate the fair value of the companies we seek to invest in. If the current price is higher than the value The Fund estimates, we do not invest. If the current price is lower than the value The Fund estimates, we may invest. The bottom-up approach allows us to focus on individual companies as opposed to a top-down approach that focuses on certain sectors of the economy.

The Fund utilizes two main models to estimate the value of a company's stock price: they are the free cash flow to the firm model (FCFF), and the relative valuation model. The FCFF model allows our managers and analysts to estimate the future cash flows of a company to help derive a fair share price in

the present day. The relative valuation model allows us to compare a given companies ratios to that of its competitors to evaluate how they compare to their competitors across several ratios.

The Fund provides students of all majors the opportunity to help grow the University's endowment while offering real world experience by trading with real money. On top of creating models, members of The Fund also write up investment theses, laying out all the justifications behind their model decisions. The Fund has provided many students with experiences they have used as resume builders, in job interviews, and for many individuals, experience in their post graduate careers.

**Georgia Nicewonger Darcey Petrus, Ethan Brosnan** (Dr. Eileen Steinle Alexander, Health Services Administration)

Alter Hall Poster Session 1 - 2nd floor 2:15-3:00 pm

*Community Service Partnership to Assess Vision Care Access for Underserved Zip Codes & Identify Improvement Opportunities for Care Delivery*

**Background/Aim:** 90% of individuals living in underserved communities have limited access to vision care<sup>1</sup>. A recent study showed access to eye care did not correspond to current visual burdens, and instead cited financial and logistical barriers as the culprits<sup>2</sup>. OneSight EssilorLuxottica is an independent, non-profit company that provides access to quality eye care and eyewear in underserved communities. The objective of this study was to describe OneSight's patient population at the Xavier University clinic and survey patients to identify opportunities for improvement in the mobile clinics. To do this, OneSight partnered with Xavier University students in the Health Services Administration Quality Improvement course to collect and analyze data for potential areas of improvement.

**Methods:** OneSight patient zip codes were collected and analyzed in conjunction with the Census Bureau public data. Standard quality improvement methods and tools were followed. Patient satisfaction was surveyed to identify priority needs to improve the clinic's operations, using a 5-point Likert scale. Microsoft Excel Professional Plus for 2016 was used to compare data and review results.

**Conclusion:** The majority of patients had never received vision care before or had received care inconsistently over a period of years. Our research confirms that OneSight treated an underserved patient population who could benefit from improved operational processes of the mobile clinics. The clinic check-in process has the greatest need for improvement.

**Implications:** Future mobile OneSight clinics may wish to target patients who receive care on an inconsistent basis, thus reducing the gap of years between vision care visits. Future students in Quality Management and Performance Improvement or OneSight employees could create a workflow map for check-in process improvements. Repeated surveys will identify improved care, consistency of care, and operational improvements.

**Isaac Blaney** (Dr. Bryan Buechner, Dr. Ashley Stadler-Blank, Marketing)

Alter Hall Poster Session 1 - 3rd floor 2:15-3:00 pm

*Consumer Perceptions of Artificial Intelligence in Sports Betting*

In response to the tremendous growth of sports bettors in the U.S. (AGA 2019; 2022), many gambling and fantasy sports platforms have integrated artificial intelligence into their experience to provide recommendations that influence user engagement and performance (Hoffman 2021; Purser 2019). However, extant research demonstrates that despite the ability of artificial intelligence (AI) to assist

individuals in decision-making, an aversion to AI emerges across a variety of domains (Longoni and Cian 2020). To date, however, we are not aware of any research that investigates the impact of AI in the context of sports betting. Further, we provide a nuanced perspective to this aversion to AI by investigating the mediating role of expertise (Jussupow et al., 2020).

Our findings suggest users are hesitant to follow AI recommendations, leading to suboptimal decision-making. Results from 6 studies suggest consumers evaluate AI as “less expert” than humans, are more averse to the AI recommendations and, thus behave (i.e., bet) in favor of the human recommendation. We demonstrate this effect experimentally using within- and between-subjects designs. The hypothesized relationship was consistently mediated by differences in perceived expertise, and independent of perceived trust, consumers’ betting and sports knowledge, and valence of information presented in the recommendation.

**Danyelle Taylor, Vanel Kamdoun** (Dr. Minnie Catral, Mathematics)

Alter Hall Poster Session 1 - 3rd floor 2:15-3:00 pm

*Digraphs and sign patterns that allow exactly one distinct eigenvalue*

A sign pattern is a matrix with entries in  $\{+, -, 0\}$ . A directed graph (digraph)  $\Gamma$  on  $n$  vertices consists of a vertex set  $V(\Gamma) = \{1, 2, \dots, n\}$  and an arc set  $E(\Gamma)$  where  $(i, j) \in E(\Gamma)$  if and only if there is an arc from vertex  $i$  to vertex  $j$ . We introduce sign pattern matrices and their associated digraphs. We investigate the digraph structure of patterns that allow a certain number of distinct eigenvalues, in particular, those that allow exactly one distinct eigenvalue.

**Olivia Wakefield** (Dr. Benjamin Chamberlain, Music & Theatre)

Alter Hall 211 3:40-4:00 pm

*Incorporating Artificial Intelligence In the Music Classroom*

686 While education researchers have studied artificial intelligence since the 1970s, most teachers even today know little about how artificial intelligence works and how it can be used in classrooms. However, artificial intelligence can motivate students, provide individualized instruction, and leave teachers more time to focus on the interpersonal aspects of their job. Because many music teachers want to use more technology in the classroom but have limited time for learning about new technologies, the goal of this project was to create resources for music teachers to incorporate existing artificial intelligence technologies in their classrooms. A website was created and published to provide teachers with information and ideas for using AI in their classrooms. The site provides technologies that are free, do not require downloads, and can be used without creating an account. In addition to lesson plans and links to specific technologies, the website provides an overview of how artificial intelligence works and tips for protecting student privacy to help teachers better understand the technologies they are bringing into their classrooms. The website is published at: <https://sites.google.com/view/ai-music-education/>

**Susmita Subba** (Dr. Marco Fatuzzo, Physics)

Alter Hall Poster Session 1 - 3rd floor 2:15-3:00 pm

*Formation of Supermassive Black Holes*

The Star formation model is used in this study to examine the formation of quasars and Supermassive Black Holes (SMBH). The difference in SMBH formation is that materials that fall into the disk surrounding black holes do not contribute to their final mass. Initially, all materials within Schwarzschild's radius ( $R_s$ ) are drawn into the black hole. However, this changes when a black hole's radius is no longer  $R_s$  and becomes a centripetal radius ( $R_c$ ). Using this information, we can model materials falling into and outside of the black hole to study the mass-time relationship. Then the mass vs time graph can be converted to a redshift graph with prior knowledge of the time ( $t$ ) and redshift ( $Z$ ). Further, we used this relationship to relate the BH formation time to the redshift and compare the findings to prior observations.

**Connor Tomlinson, AJ Norman** (Dr. Heidrun Schmitzer, Physics)

Alter Hall Poster Session 2 - 3rd floor 4:00-4:45 pm

*Inertial Cavitation and its Relationship with Fluid Fill Height*

Cavitation occurs when a fluid is subjected to near-vacuum pressures which causes homogeneous nucleation inside the fluid. This phenomenon can be observed with the formation of bubbles which collapse after a short period of time and have the ability to inflict damage on surfaces. With a critical Cavitation number equal to the number one, varying fill heights will have an impact on whether cavitation does or does not occur. Prior research shows that, with increasing fill height, the cavitation number would decrease below critical, causing more cavitation. The goal of this experimentation is to further examine this relationship between fill height and cavitation number using a new, high-speed camera. In addition, the effects of the cavitation on the equipment and testing apparatus are also studied.

**Matthew Wright, Jackson Parker, Chantz Dalton** (Dr. Justin Link, Dr. Haider Raad, Physics)

Alter Hall Poster Session 2 - 3rd floor 4:00-4:45 pm

*Prosthetics and Biophysics: Addressing Prosthetic Limitations with High-Density Electrode Arrays.*

As the world population grows, increased numbers of amputees require the need for prosthetics. However, in the case of upper-limb prosthetics, technology is limited. Many upper-limb prosthesis are limited to only small degrees of movement preventing amputees from returning to their initial quality of life prior to amputation. During the study, fundamental knowledge of the field was improved by building a human controlled robotic arm that responded to electrical signals created by select arm movements, known as EMG signals. Constructing an elaborate electronic circuitry to convert the EMG input signals to output signals that can be received and understood by electronic servomotors in the robotic arm, was part of the experience. Upon completion of the project, components of this lab were used to explore the possibility of converting multiple EMG input signals from high-density electromyography arrays. Higher density arrays will allow for improved control in a prosthesis. The ultimate goal of this study is to design a high-density electrode array that successfully collects high amounts of EMG signals from a designated area of the forearm that may be compatible with hand amputees in need of prosthetic technology.

**Elizabeth Hyland, Maria Fulhorst, Jocelyn Fox, Wendy Alvarez and Natalie Hall** (Dr. Mack Mariani, Political Science)

Alter Hall Poster Session 1 - 3rd floor 2:15-3:00 pm

*Are Women Legislators More Productive Than Males?*



Research on the relationship between gender and productivity in Congress has produced mixed results, with some studies indicating that women legislators are more productive than men and others finding no relationship. Thus far, few researchers have examined the impact of gender on productivity in state legislatures. In this study, we examine the role of gender in legislative productivity in the Ohio General Assembly. We believe that women legislators are likely to be motivated to introduce legislation by the desire to prove themselves in a gendered environment. Moreover, the “exceptional” hypothesis suggests that women who make it to legislatures are likely to be exceptional in many respects, given the obstacles that women face in society and politics. Therefore, we hypothesize that women in legislative positions in Ohio outperform men in productivity. Our sample includes the 133rd and the 134th Ohio State General Assemblies and we control for age, race, district, party, chamber, and whether the legislator was a committee chair. Legislative productivity is measured by the number of bills introduced and passed during the legislative session.

**Amari Davis, Robert Goldsberry, Andrew Bridenstine, Sabrina Loxtercamp, Bobby Gerity** (Dr. Mack Maraini, Political Science)

Alter Hall Poster Session 1 - 3rd floor 2:15-3:00 pm

*Does District Diversity Have an Impact on Political Ideology of a Legislator?*

Extensive research has been conducted to examine the relationship between district diversity and the political ideology of legislators. Previous research has generally focused on the relationship between members of Congress while few studies have investigated the relationship at the state level. In this study, we examine the relationship between district demographics and the ideologies of members in the Ohio State House elected in 2016. Our measures of ideology include legislators’ American Conservative Union scores and the Shor-McCarthy ideological measure. The study controls for district-level characteristics such as median age, partisanship, and income within the districts, we examine the relationship of the representation to their districts. We hypothesize that the more diverse the district is, the more moderate the elected representatives will be.

**Ryan Breece, Daniel Kelly, Colin Phillips, Kenny Schneider** (Dr. Mack Mariani, Political Science)

Alter Hall Poster Session 1 - 3rd floor 2:15-3:00 pm

*Does Campaign Fundraising Affect State Legislative Productivity?*

Researchers have theorized that there is a relationship between campaign fundraising and legislative productivity. Studies on Congress found that while campaign fundraising does not affect an individual’s voting record, it does affect what bills these legislators introduce. Thus far, however, there has been little research analyzing this relationship at the state level. In this study, we examine whether new state legislators in the state of Ohio who raise more campaign money introduce more legislation than new legislators who raise less money. In our research, we focus on new members elected to the Ohio General Assembly in the 2014-2020 cycles. Our key variables include campaign funding raised by new members and the number of substantive bills the new members introduced in their first term in office. In our study, we control for chamber (house or senate), gender and party.

**Andrew Titgemeyer, Will Pembroke, Madeline Anderson, Ryan Machesky** (Dr. Mack Mariani, Political Science)

Alter Hall Poster Session 1 - 3rd floor 2:15-3:00 pm

*Does gender of legislator effect degree of substantive representation?*

How well do legislators represent constituents of different socio-economic classes? Substantive representation refers to how well a group's interests are manifested in legislation passed by their representatives. The literature finds clear evidence of increased substantive representation when a legislator shares in gender or ethnic background with the relevant interest group but offers less clear results regarding economic class. This paper explores the link between legislator gender and the degree to which they substantively represent different economic classes. Data on House bills passed in Ohio in 2016 will be used for the inquiry. All bills from the sample will be sorted by what economic group they affect (working class, business class) and ran against the gender of the legislator in a statistical analysis.

**Matthew Bernardo, Reese Turner, Erik Canady, Emily Flowers** (Dr. Mack Mariani, Political Science)

Alter Hall Poster Session 2 - 3rd floor 4:00-4:45 pm

*The Effect of Age on the Political Ideology of Ohio Legislators*

In previous studies, it has been shown that there is a strong correlation between age and ideology, with older legislators voting more ideologically consistent than younger legislators. It has also been shown that as politicians age, they identify more heavily with their party. In contrast to these findings, other studies suggest that older-generations of politicians are more moderate than their younger colleagues. In this study, we assess the relationship between age and ideology in the Ohio General Assembly in the 2019-2020 legislative cycle. We measure ideology using Shor-McCarty ideology scores and American Conservative Union Scores and control for factors such as race, gender, and district partisanship. We hypothesize that older legislators will be more ideologically extreme (more liberal, or more conservative) than younger legislators.

**Jack Putney, Jay Butcher, Rhea Goodwyn** (Dr. Mack Mariani, Political Science)

Alter Hall Poster Session 2 - 3rd floor 4:00-4:45 pm

*The Relationship Between Age and Productivity in the Ohio State Legislature*

During the debates on term limits, opponents raised concerns that legislators would be less productive because of frequent turnover and a decline in the number of experienced legislators. One impact of term limits, however, is to create more opportunities for younger legislators to run for, and serve in, the legislature. Few studies have examined how age impacts legislative productivity at the state legislative level. Accordingly, this study examines that relationship in the Ohio Legislature by comparing committee leadership/membership, bills introduced, and bills passed with age of the legislator, and experience in the chamber during the 2019-2021 legislative session. We hypothesize that experience will benefit the legislator's productivity, both ends of the age spectrum will end up being the least productive members of the assembly.

**Katie Ripley** (Dr. Bashir Tofangsazi, RIGS)

Alter Hall 208 3:20-3:40 pm

*An Examination of the Association Between LGBTQ+ Status and Food Insecurity*

Food insecurity is a massive problem for both the United States and the entire world. Many people struggle to find enough nutritious food on both a day-to-day basis, or even occasionally. Previous research suggests that certain minorities may be at a disproportionate risk of experiencing food insecurity. One minority community for whom there is little research on this topic is the LGBTQ+ community. This leads one to ask the following question: Is there a relationship between LGBTQ+ status

and food insecurity? LGBTQ+ individuals often face issues related to food insecurity, such as homelessness and poverty. In order to determine if there was a relationship between these two variables, I used data from the 2021 General Social Survey (GSS). After completing a chi square test and creating a cross table, it became evident that the relationship between the two variables was not statistically significant. However, after controlling for race, age, and educational level, it became evident that racial minorities and those who have lower educational levels may be significantly more likely to experience food insecurity than their peers.

**Aleya Justison** (Dr. Jaylene Schaefer, Social Work)

Alter Hall Poster Session 1 - 3rd floor 2:15-3:00 pm

*Addressing Exposure to Community Violence in Youth: Understanding Teacher and Support Staff Capacity to Implement School-Based Interventions*

Childhood exposure to community violence (ECV) can cause lasting effects on youth development, behavior, and life trajectories. Community violence is a type of violence that happens outside of the home or family setting, including but not limited to, experiencing or witnessing shootings/gun violence, fights, threats of harm and more. The impacts of these exposures subsequently effect the way students show up to school, interact with peers, and perform academically. Schools have the possibility to be an important resource and protective factor when addressing the negative impacts of ECV. However, the research lacks evidence around school-based interventions and the role of schools in preventing and addressing ECV. Teacher and support staff experience, readiness and emotional capacity could be an important factor in determining future interventions. In this study, teachers and support staff at Riverview East Academy were surveyed to assess their professional quality of life and to determine their capacity for implementing new interventions and programs for students, using the Professional Quality of Life (ProQOL) survey from the Center for Victims of Torture. The ProQOL survey scores professionals working in helping fields in the areas of compassion satisfaction, burnout, and secondary traumatization. From these scores, this study hopes to evaluate the correlation between these categories and its possible connections to the readiness and willingness of teachers to implement new interventions around ECV. Results will be presented.

**Emma Kubelk, Jamia Martin** (Dr. Jaylene Schaefer, Social Work)

Alter Hall Poster Session 1 - 3rd floor 2:15-3:00 pm

*CLCI's Benchmark Model*

Although countless research has been conducted linking academic success to everything from in utero exposure to classical music to eating blueberries, there is no exact formula for predicting academic achievement. Community Learning Center Institute (CLCI) is a national leader in leveraging public school facilities to become hubs of educational, recreational, cultural, health, and civic partnerships, which optimize the conditions for learning and catalyze the revitalization of the community. CLCI specific mission goals are divided into eleven benchmark metrics. Each benchmark metric, when combined with others, plays a critical role in a child's overall success in school. Metrics such as these, which have been studied widely within CLCI, offer insight into each student/ child's academic success and their standings in relation to each benchmark. The benchmarks are as follows; Kindergarten readiness, 3rd grade reading level, ACT/Graduation, Co-curricular activities, Summer Learning Opportunities, Regular Attendance, Enrollment Stability, Health and Wellness, Parents are Partners, Economic Well-Being, and Schools as a Hub for Community. In order to better understand the needs of a given student, the study

at hand was conducted in effort to measure one student's growth and standing within each of the aforementioned benchmarks. Furthermore, the observation and cataloging of this student's progress will provide an empirical basis for analyzing a given student's status and progress.

**Kourtney Williams** (Dr. Jaylene Schaefer, Social Work)

Alter Hall Poster Session 1 - 3rd floor 2:15-3:00 pm

*Directors of Nursing Talk Pain Relief in Long-Term Care Facilities*

Long-term care homes are meant to give elderly and disabled individuals the best quality of life which can require helping residents maintain their physical wellbeing. As individuals lose the ability to perform daily living activities, pain can become a huge hinderance especially if pain persist. When working in Long Term Care (LTC) homes, the client must be placed at the center of care particularly when dealing with pain relief. The Director of Nursing (DON) job is to coordinate and oversee the nursing care off all residents in the facility and manage communication and delivery of care, including pain relief. Some research alludes that poor pain relief can be a result of low revenue in facilities. In this study, I speak with DONs at facilities with different affluence to explore if residents' payor source has any impact on the different ways that facilities provide pain relief. While the study cannot claim definitively if there is a significant relationship between a resident's payor source and avenues typically available for pain relief, it will look further into pain relief and determine first, the different ways it is treated and create a foundation for more studies in the future.

**Olivia Watts** (Dr. Jaylene Schaefer, Social Work)

Alter Hall Poster Session 1 - 3rd floor 2:15-3:00 pm

*Exploring the Correlation between Case Manager's Risk Assessment Ratings and Participation in Case Management Services among Human Trafficking Survivors*

This study examines the relationship between case managers' risk assessment ratings on human trafficking survivors served by Salvation Army and their participation in case management services. In social work, a risk assessment score can help case managers determine a client's level of vulnerability and potential harm, assess their need for interventions, and determine the intensity and duration of services required. Clients who are more vulnerable may face numerous barriers that can impact their ability to attend case management services consistently. These barriers may include lack of transportation, employment, housing, mental health or physical health issues, etc. In addition, clients who are more vulnerable may also face higher levels of stress and trauma, which can make it challenging for them to engage consistently in case management services. The research aims to determine if higher risk assessment ratings are positively correlated with increased participation in case management services. To determine this, secondary data analysis was conducted by collecting risk assessment scores from four categories on ten clients, over a one-year time frame. The four categories analyzed were transportation, housing, relationship/community, and the substance abuse scores. Having a lower risk score (0-2) means that the client is more vulnerable, while having a higher score (3-5) on their risk assessment means the client is at less of a risk for vulnerability. Following the risk assessment scores, attendance in case management services were recorded for each month. Data is still being collected at this time, but will be analyzed and reported on if there is a correlation between risk assessment scores and attendance in case management services in human trafficking survivors served at Salvation Army. The findings of this study can inform the development of effective interventions for human trafficking survivors and improve their access to necessary resources.

**Chloe Ealy** (Dr. Jaylene Schaefer, Social Work)

Alter Hall Poster Session 1 - 3rd floor 2:15-3:00 pm

*Highland Elementary Spring Small Group Intervention Outcomes: Teacher Ratings on Students' Positive Social Skills*

The demands placed upon schools today include meeting all students' academic and social needs. Social skills instruction in small groups has been recommended to improve the social competence of elementary-aged students who struggle socially or emotionally with desired positive social skills. This research aimed to discover how Highland Elementary's teachers rated their student's positive classroom social behaviors five weeks into social skill groups compared to the start of the groups. To answer this, 44 responses of student data inputted by their teacher were analyzed from the teacher data sheets at week 0 and week 5. On these sheets, teachers ranging from Kindergarten to sixth grade, rated their students 0-3 on their degree of difficulty with the positive behaviors in the classroom (3 having the hardest difficulty). By gathering and analyzing this information, the positive social skills that improved or did not improve after five weeks can be deciphered. The results are still being collected and will benefit the agency, school staff, and students because they can find areas to improve the social skill group curriculums to build more substantial student outcomes in small groups.

**Mercedes Torres** (Dr. Jaylene Schaefer, Social Work)

Alter Hall Poster Session 1 - 3rd floor 2:15-3:00 pm

*Call for Legal Aid Services at Domestic Violence Shelters*

This explorative study aimed to gain more knowledge on legal services offered or referred to survivors of domestic violence, by their intervention coordinator. Previous research on intimate partner violence and barriers to seeking help have suggested the following services to help survivors of domestic violence and to improve knowledge among professionals. The services include the need for financial resources and a supportive network; childcare and resources to get an education or work; and legal routes. (Kiamanesh & Hauge, 2019). This study examines legal aid services and referrals completed by intervention coordinators at YWCA Hamilton County Domestic Violence Shelter. In response to the barriers of seeking help for survivors of intimate partner violence, the YWCA provides two safe, secure, trauma-informed, confidential shelters for survivors of intimate partner violence. The shelters provide immediate safety and protection, allowing survivors to work towards longer-term security and stability through securing housing and providing services and referrals. Services and referrals are made by clients' intervention coordinators including referrals to legal aid, workforce development, children's programs, and aftercare. The data was collected in the form of a survey and distributed via email. Surveys were distributed to the four intervention coordinators at YWCA Hamilton County Domestic Violence Shelter based on their clients during the month of March 2023. This presentation aims to explore the relationship, if any, between the need for legal aid and survivors of intimate partner violence. While also considering the possible impact of barriers to the client for utilizing services and referrals. Factors that may prevent survivors to utilize legal aid referrals and services include but are not limited to, the willingness of the client, time management, eligibility, and financial resources. Results have been collected and will be presented later.

Kiamanesh, P., & Hauge, M. (2019). "We are not weak; we just experience domestic violence"—Immigrant women's experiences of encounters with service providers as a result of domestic violence. *Child & Family Social Work*, 24(2), 301–308. <https://onlinelibrary.wiley.com/doi/10.1111/cfs.12615>

**Logan Hayes** (Dr. Jaylene Schaefer, Social Work)

Alter Hall Poster Session 2 - 3rd floor 4:00-4:45 pm

*Impact of Childhood Trauma on Adult Housing Instability*

Trauma, abuse, and neglect during childhood are potent risk factors for psychiatric disorders, substance misuse disorders, and homelessness. The Adverse Childhood Experiences (ACEs) questionnaire is a short, ten question survey that serves as an instrument to determine the amount of and type of traumatic event(s) that may have occurred in one's childhood. Surveys were distributed to clients within the Stable Families program at Santa Maria Community Services who are actively experiencing a housing crisis. The study presented will address these clients through the integration of the ACEs questionnaire with the goal of analyzing the potential relationship between traumatic childhood experiences and adult housing instability. Gathering this research will encourage the implementation of specific practices or theoretical frameworks that helping professionals can use to prioritize physical and emotional safety, help reduce practices that may retraumatize an individual, and foster trusting relationships.

**Liz Cortez** (Dr. Jaylene Schaefer, Social Work)

Alter Hall Poster Session 2 - 3rd floor 4:00-4:45 pm

*Physical Activity Programs for Long-Term Care Residents with Cognitive Decline*

Cognitive decline, without a doubt, has a negative impact on both individuals and society, particularly in terms of healthcare, social services, and the economy. Across all age groups, older adults experience the greatest decline in cognitive functions. With the ongoing demographic shift created by the increase in life expectancy and the decline in birth rates, the search for ways to prevent or, at least, slow down the progress of cognitive decline has become increasingly important. Measures like a healthy diet, lifestyle choices, and physical exercise have proved to be highly beneficial for individuals with this condition. This is why the present study aims to describe the current state of physical activity programs for residents with cognitive decline who live in Long-Term Care (LTC) facilities in Butler, Clermont, Clinton, Hamilton, and Warren counties. Specifically, the current study investigates the types of physical activity programs available and implemented in LTC facilities. Data for this study was collected through the use of a survey method, which included questions about the types, frequency, and duration of physical activity programs available in LTC facilities in the counties previously mentioned. This survey was conducted by phone or in person during regular presence visits. This study provides important information that could lead to improvements in the quality of care provided to residents with cognitive decline in LTC facilities.

**Isaiah Johnson** (Dr. Jaylene Schaefer, Social Work)

Alter Hall Poster Session 2 - 3rd floor 4:00-4:45 pm

*Racism's Effect on the Grief of Black Homicide Survivors*

Grief is a common and normal response to the death of a loved one. However, grief can evolve into complicated grief depending on the circumstances surrounding the death and the grieving individuals' ability to cope with their grief. When grief becomes complicated, the symptoms of sorrow and hopelessness deepen and last for significantly longer. As such, practitioners who work with individuals experiencing grief act quickly to help prevent grief from evolving into complicated grief. However, an overlooked element that can lead to complicated grief is racism. Specifically, the history of oppression and racism that black Americans have faced presents additional factors that can complicate grief. In this study, an assessment based on the Inventory of Complicated Grief was administered to 14 black survivors of homicide. The assessment was adapted to examine 8 themes associated with the grief of

black survivors of homicide, and how often they experience feelings related to these themes. Specifically, they were assessed on how the death of their loved ones affected their feelings about the criminal justice system, the reinforcement of racial stigmas, shame, stoicism, self-blame, unfavorable media representation, the general history of racism, and remaining connected to the deceased through pain. Comparative analysis was also done among the sample to determine if there were differences in the grief of black men and black women.

**Margaret Michaletz** (Dr. Jaylene Schaefer, Social Work)

Alter Hall Poster Session 2 - 3rd floor 4:00-4:45 pm

*The Relationship between Gender and Sentencing of Youth Homicide Offenders*

In looking at the juvenile justice system, the relationship between gender and sentencing has hardly been analyzed or understood. Perhaps due to a lack of research, the little literature in this area suggests that gender has an impact on the guilty adjudication and lengthy prison sentencing of youth offenders (Swayze & Buskovich, 2011). This study looked at the relationship between gender and prison sentencing among youth homicide offenders, ages 12-17 in Hamilton County, OH, from January 2018 to December of 2022, who were tried and sentenced as adults. The purpose of this study was to discover more information regarding the impact that gender could have on the sentencing of youth homicide offenders, as there is little to no research in this area. This study utilized an observational research design, in which data collection and analysis took place by observing pre-collected data from the Hamilton County Public Defender's database (JCMS). Over a two-week process, this data was collected, stored in two different excel files, and then analyzed through the Statistical Package for the Social Sciences (SPSS). The data collected looked at the youth offender's gender, age, and prison sentencing time length (years). Participants included thirteen youth homicide offenders, two of which were female and eleven of which were male. Findings highlighted that while male offenders had an average of 16.3 years in sentencing, female offenders had an average of 21 years. Additionally, a correlation test ran on this study accepted the null hypothesis, in that the significance level of  $.564 > .05$ , meaning this study lacks statistical significance. However, the maximum sentence given to a youth homicide offender was to a female: 40 years to life in prison. Further, this study does hold clinical significance, as information on gender and sentencing has never been studied in the Hamilton County Juvenile Justice System before. Although, the limited size of the female offender sample greatly affected the results of this study. Other limiting factors included a small sample size overall, limited access to information on this topic, and time limitations on collecting and analyzing research. This study sought to understand if there was a relationship between the gender and prison sentencing of youth homicide offenders. Further, the clinical significance of this study warrants deeper research into the relationship between gender and sentencing within the juvenile justice system.

**Grace Van Pelt** (Dr. Jaylene Schaefer, Social Work)

Alter Hall Poster Session 2 - 3rd floor 4:00-4:45 pm

*The Use of Telehealth in Behavioral Healthcare*

Mental illness is a serious issue within the United States. Despite its significant prevalence, the needs of individuals are often unmet due to a lack of providers, cost, and systemic/structural problems. Telehealth has been used for decades in healthcare, however, its use in behavioral healthcare has experienced a recent surge due to the covid 19 pandemic and the pressing need for accessible treatment. The presented study will describe the benefits and barriers to using this care method to treat

mental illness. A 10 -question survey describing varying aspects of care related to telehealth was administered. Participants consisted of behavioral health care providers at Greater Cincinnati Behavioral Health who currently utilize telehealth. This study aims to learn about and describe the relationship between the use of telehealth and the treatment of individuals with mental illness. The results of this research can be used to assess this method of care and see how it may be impacting the level of care being provided in a positive or negative manner.

**Alisha Yerovi** (Dr. Marcus Mescher, Theology)

Alter Hall 206 3:40-4:00 pm

*Implications of Theology and Ecological Conversion for Responding to Biodiversity Loss*

While the intersection of theology and ecological issues has been growing in interest, within this topic, there has been less attention given to the issue of biodiversity. This is especially true for smaller organisms such as insects, which tend to be overlooked and understudied, despite their importance and the ecological threats they face. In my research, I reviewed some of the existing literature on theology and biodiversity, and sources dealing with ecological issues more broadly to see how these foundations could apply to biodiversity in a way that accounts for those creatures which too often go unnoticed. One such source was *Laudato Si*, in which Pope Francis discusses the need for “ecological conversion.” I first explored the ways in which this would require beliefs and value systems to change. Next, I investigated what might motivate people to reach these changes, including perspectives from the field of psychology regarding pro-social and pro-environmental emotions and behaviors. I discuss the implications that these insights have for our approach to biodiversity loss, and how they relate to theological traditions and concepts. Finally, I attempted to bridge the gap between individual pro-environmental behaviors and collective action.