


SPRING STUDENT SYMPOSIUM

Ohio
Wesleyan
University

**THURSDAY, APRIL 18TH
4:10 PM | MERRICK HALL**

An aerial photograph of the Ohio Wesleyan University campus during the golden hour of sunset. The central focus is a large, historic stone building with a prominent, tall, square tower featuring a pointed roof and arched windows. The building's facade is illuminated from within, and the sky above is a warm, hazy orange. To the right, another large, light-colored building with a red roof is visible. The campus is surrounded by lush green trees, and an American flag flies on a tall pole in the foreground. The overall scene conveys a sense of academic tradition and community.

The Symposium provides an opportunity for students to share their work with the OWU community and enter a dialogue that can spur ideas for new projects.



THE SPRING STUDENT SYMPOSIUM

The Spring Student Symposium showcases the research and creative work of Ohio Wesleyan students across the academic spectrum.

The Symposium provides an opportunity for students to share their work with the OWU community and enter a dialogue that can spur ideas for new projects.

Undergraduate research, scholarship, and creative projects conducted and performed under the mentorship of expert faculty are central components of The OWU Connection. The annual Student Symposium shows the breadth, innovation, and quality of work produced by Ohio Wesleyan students.

**THE OWU
CONNECTION**
THINK BIG. DO GOOD. GO GLOBAL. GET REAL.

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BOARD 1A

SOPHIA HOLUPKA

PARASITE COMMUNITIES IN SUNFISH (CENTRARCHIDAE) FROM THE OLENTANGY RIVER, OHIO, USA

Faculty Mentor: Ramon Carreno
Department of Biological Sciences

A parasite survey of sunfishes was carried out at three sites in the Olentangy River, Delaware, Ohio. A total of 413 fish were collected August 2022 through December 2023 and examined for parasites. We found 22 parasite species in the centrarchid population. Metacercariae (mostly *Posthodiplostomum minimum*) and *Spinitectus* spp. were the most common parasites recovered. Additional parasites included 3 species of acanthocephalans, 2 cestodes, 3 nematodes, 7 trematodes, monogeneans, crustaceans, and 3 species of leeches. Bluegill (*Lepomis macrochirus*) had a larger abundance of parasites than green sunfish (*Lepomis cyanellus*). Other species including rock bass (*Ambloplites rupestris*), orange-spotted sunfish (*Lepomis humilis*), northern sunfish (*Lepomis peltastes*), white crappie (*Pomoxis annularis*), black crappie (*Pomoxis nigromaculatus*), and redear sunfish (*Lepomis microlophus*) were also investigated and found to have less parasite diversity than the former two host species. From the three sites sampled, the overall parasite community had more species abundance in the non-urban collection locality than in the two urban sites. Our results indicated that there were significant differences in parasite communities among the three sites, all of which are within 10 km of each other.

BOARD 1B

LOGAN FRAIRE

WHAT FACTORS AFFECT THERMOREGULATORY DECISIONS IN COMMON WALL LIZARDS (PODARCIS MURALIS)?

Faculty Mentor: Eric Gangloff
Department of Biological Sciences

Effective thermoregulation is necessary for most ectothermic organisms to perform essential functions critical to survival. However, little is known about what factors affect thermoregulatory decisions in natural environments. Further, few studies consider organismal activity patterns throughout an entire day concerning temperature and other environmental factors. Such data are particularly useful in understanding persistence and habitat use, especially for invading species in novel environments. We quantified the factors affecting daily activity and thermoregulatory decision-making in introduced populations of the Common Wall Lizard (*Podarcis muralis*) in Cincinnati, Ohio, USA. During the summer we performed standardized surveys every 30 minutes across the entire daily activity period (08:00 to 20:00), recording lizard body temperature using infrared thermography and lizard behavior. We used 3-D printed operative temperature models to measure available temperatures throughout the day and collected data on air temperature, humidity, solar radiation, UV radiation, and wind speed. By combining repeated-measures data on the activity and body temperature of individual lizards in situ with a suite of environmental data, we can identify the factors that affect lizard thermoregulation. We present these data in the context of understanding how these ectotherms can respond to urban environments and rapidly changing climates.

BOARD 2A

**SARA BIAS
MCKENNA TUTTLE****DIFFERENCES IN CORE MUSCLE
ELECTROMYOGRAPHIC ACTIVITY DURING
UNILATERAL AND BILATERAL CARRIES**

Faculty Mentor: Andrew Busch
Department of Health & Human Kinetics

College athletes participate in lifting programs that often utilize core exercises to challenge the postural stability of the athletes with the intent of improving their abdominal wall muscle endurance and overall strength. This research was to determine if there is a difference in electromyography (EMG) within core musculature during unilateral and bilateral farmers carry. This study examined thirty-two healthy male, Division III collegiate athletes (age = 19.54 ± 1.06 years, height = 178.62 ± 5.58 cm, weight = 83.11 ± 13.27 kg) from Ohio Wesleyan University. Each athlete performed a max voluntary isometric contraction (MVIC) of their rectus abdominis (RA), external oblique (EO), and erector spinae (ES). Subjects then completed three different types of farmer carry holds including a bilateral (BL), contralateral (CL) and ipsilateral (IL) carry using two different weights, 25% body weight (BW) and 12.5% BW in random order. For all three abdominal muscles recorded, there was a statistically significant two way interaction between the weight used and type of carry. When comparing weight used during the CL carries, the 25% BW elicited treated EMG activity by the means calculated. All carry types created greater EMG activity in RA, EO, and ES during 25% BW compared to 12.5% BW carries. CL farmers carry produced greater EMG activity in abdominal muscles when compared to IL and BL.

BOARD 2B

**GABRIEL EBERHARD
NATHAN OKE
WES SILVER
NATALIE VANMETER****ANALYSIS AND FORECAST OF THE
HOUSEHOLD SECTOR**

Faculty Mentor: Goran Skosples
Department of Economics and Business

The household sector captures a view of the economy from the perspective of consumers. It deals with everything related to costs of living, expenditures, prices of housing and rent, and much more. Our team has been on an ongoing mission to analyze and understand this sector by following four variables. The first of these is The Personal Consumption Expenditure Price Index (PCEPI) which measures how prices of goods and services that households buy change over time. In fact, it is preferred by the Fed as a measure of inflation, one of the most relevant factors in economic health and standards/cost of living. The Case-Shiller Housing Price Index is used to measure real estate prices in the United States. The CSHPI is used to show changes in residential real estate prices, and accurately depicts these changes from month to month. There are three forms of the CSHPI, the national index, the 10 city index, and the 20 city index. Real Retail and Food Service Sales Report provides an up to date indication of sales of retail and food service industries. The information provides reliable measures of economic activity in the United States in regards to personal consumption across retail industries and the tracking of consumer spending. The data impacts a wide range of policy decisions in regards to GDP estimates. These estimates indicate how healthy an economy is based on the level of consumption. The Chicago Fed National Activity Index is based on 85 monthly indicators from broad categories of macroeconomics; production and income; employment, unemployment, and hours; personal consumption and housing; and sales, orders, and inventories. The values are coincident with GDP and have been able to forecast business cycles with 95% accuracy.

BOARD 3A

REAGAN BRAKE MATTHEW KELLEY HAYDN PETERSON AMARILYS TORRES-NUNEZ

CUBAN MIGRATION, FOOD, AND IDENTITY IN LOUISVILLE

Faculty Mentors: Christopher Fink, Liz Nix
Department of Health & Human Kinetics

Cuba has experienced various waves of emigration particularly since the Cuban revolution, with many migrants settling in the United States. Food can be used in identity work, to reinforce family, place, and tradition, and as a form of cultural capital. In diasporic communities, food connects community members, and serves as cultural resistance to societal norms. During the spring semester, we were enrolled in independent study and directed reading classes focused on Cuban migration, food, and identity. We submitted a TPG proposal focused on exploring these themes in both Miami and Cuba later this summer, and as a first step for developing context, we were funded through the Small Grant Program to travel to Louisville, Kentucky to explore these same themes, gather contextual information, and develop richer research questions to explore during our potential next research steps. Louisville, KY is currently the second largest Cuban diasporic community in the U.S., after Miami, and the number of Cuban immigrants and Cuban-Americans residing in Louisville has doubled since 2019. While in Louisville, we met with Catholic Charities of Louisville, one of the largest service agencies assisting Cubans migrants in the city, and discussed how their various services are utilized by the community, as well as issues around immigration, identity and belonging, and food. We conducted structured observation and informal discussions at 4 different Cuban markets, 3 different Cuban restaurants, and visited the site of La Minga – a small-scale farm project that engages and serves the Cuban community. We will share our findings from Louisville, reflections on our experiences as community outsiders and how that shaped our interpretations, and specifics about how this experience has helped us to consider our future work on these topics in Miami and Cuba.

BOARD 3B

ANDREW INAMDAR

DETERMINING THE ROLE OF A POTENTIAL ANTIMICROBIAL GENE CLUSTER IN HAWAIIAN BOBTAIL SQUID SYMBIONT, LEISINGERA SP. ANG1

Faculty Mentor: Andrea Suria
Department of Biological Sciences

The accessory nidamental gland (ANG) of female Hawaiian bobtail squid, *Euprymna scolopes*, contains a diverse symbiotic bacterial community that has been shown to prevent biofouling of the eggs. Many of these bacteria belong to the roseobacter clade, which contains species known to produce secondary metabolites, including antimicrobials. It is not yet known exactly how these antimicrobials are produced. Analysis of roseobacter genomes using the Antibiotics and Secondary Metabolite Analysis Shell (antiSMASH) revealed potential biosynthetic gene clusters in roseobacter species. No classical antibiotic pathways were identified, suggesting any antimicrobial activity described may be novel. One symbiont, *Leisingera* sp. ANG1, contains a potential Type 1 Polyketide Synthase (TIPKS) / Non-Ribosomal Peptide Synthetase (NRPS) hybrid gene cluster. Previous metatranscriptome analysis showed that this type of gene cluster is expressed in both the *E. scolopes* ANG and the jelly coat surrounding their eggs. Multiple known antimicrobials are synthesized through hybrid PKS/NRPS pathways, including indigoidine in another *Leisingera* ANG symbiont. This study aims to determine the function of the TIPKS/NRPS in ANG1 by creating a disruption mutant in the largest gene of the cluster, a polyketide synthase. We used pEV5118 as the plasmid backbone, to which we inserted a PCR-amplified portion of the targeted gene. Plasmid construction was confirmed by DNA sequencing. The plasmid, pAJ1001, was successfully introduced into *E. coli* RHO3, which we are currently conjugating into ANG1. This will cause a targeted disruption via homologous recombination. Future research will screen for phenotypic changes in the mutant ANG strain through competitive assays against other marine bacteria. This research is significant because the TIPKS/NRPS gene cluster present in ANG1 is highly conserved among other *Leisingera* species, but no known products are described. Revealing a function for this cluster will broaden our understanding of secondary metabolism in a common group of marine bacteria.

BOARD 4A

**OLIVIA DANLEY
MAISIE DUGGER
FRANKIE NUSS
ARYAKA TICKOO**

INSIGHT INTO THE LABOR SECTOR

Faculty Mentor: Goran Skosples
Department of Economics and Business

Employment (Nonfarm Payroll), Unemployment, Average Hourly and Weekly Earnings, as well as the Job Openings and Labor Turnover Survey, serve as key indicators that collectively offer an in-depth view of the U.S. economy's health, particularly in terms of its labor status. We analyzed U.S. labor sector data during the Spring 2024 semester and derived many conclusions relevant to the overall economy. Our poster informs the audience about the definitions of the analyzed labor variables, how these variables are constructed, what these variables measure, and the historical patterns for each variable. Our poster also details the usefulness of each variable to predict economic recessions, the behavior of each variable with respect to economic theory, the limitations of using each variable to describe the state of the labor sector, and forecasted values for each variable.

BOARD 4B

**ASHLEY MOLLETT
BRITTNEY PARKS**

THE EFFECTS OF FEEDING FREQUENCY AND QUANTITY ON DIGESTION IN COMMON WALL LIZARDS (*PODARCIS MURALIS*)

Faculty Mentor: Allison Litmer
Department of Biological Sciences

Ectotherms are temperature sensitive, where higher temperatures often lead to higher performance, while lower temperatures produce the opposite effects. More specifically, temperature affects digestion, which may also be influenced by the amount of food an animal consumes in a meal. Digestion determines the amount of energy available for survival and reproduction, and is an important area of research for understanding organismal persistence in nature. We chose to experimentally quantify digestion in introduced wall lizards (*Podarcis muralis*) in relation to feeding quantity and frequency. We used a temperature cycle reflecting daytime (34°C) and nighttime (25°C) temperatures to produce a more naturally representative environment. We hypothesized that the timing and quantity lizards were fed would affect digestive performance, with food eaten in the morning at higher temperatures, and smaller meals, being digested quicker. In contrast, food consumed later in the day as temperatures cool, and larger meals, taking longer to digest. Lizards were split into four treatment groups based on quantity and frequency of feeding, with lizards receiving high or low food quantities, and fed either in the morning, or in the morning and evening. We measured food consumption, gut passage time, fecal and urate production (energy excreted and not assimilated from food), and energy assimilated from food. Food consumption significantly differed based on quantity of food offered, but passage time was not influenced by any treatment. Preliminary data indicate that feeding frequency and quantity in wall lizards may not be influential on fecal and urate production or energy assimilation. Our results suggest that wall lizard digestion is robust to temperature and food availability, which may contribute to their invasion success because such processes dictate fitness. This study also offers insight on the effects of feeding lizards large amounts of food at once on digestion, commonly used in lab approaches.

BOARD 5A

ELLIOT SPICER

PROJECTED INNOVATIVE AND SUSTAINABLE GROWTH IN COSTA RICA

Faculty Mentor: Will Georgic
Department of Economics and Business

Costa Rica's recent economic boom, fueled by a strategic shift from agriculture to a service-based economy, presents exciting opportunities for further growth. The Atlas of Economic Complexity (AEC) by Harvard Growth Lab offers valuable insights into potential new product spaces for diversification. However, the AEC's focus on economic complexity overlooks a crucial factor: environmental sustainability. This study bridges this gap by analyzing the AEC's recommendations through a sustainability lens. By considering Costa Rica's "Green Trademark" and its renewable energy capacity, we aim to identify product spaces that promote economic development in harmony with environmental responsibility. Findings show that the production of electric vehicles (EV) and implementation of charging infrastructure will create further economic growth, foster the sustainability niche that Costa Rica desires, and create potential for more renewable energy to meet the goal of 100 percent renewable energy in Costa Rica through efforts like cold ironing in the cruise and cargo industry.

BOARD 5B

IRELAND NOWAK

COMPARISON OF THE GUT MICROBIOME OF CANINES FROM RESIDENTIAL HOMES AND MILL-BRED DOGS

Faculty Mentor: Kiley Lewin
Department of Biological Sciences

The gut microbiome in canines is an under-researched topic in veterinary medicine, with a growing number of published papers in recent years. Quantification of the gut microbiome in different dog breeds has led to the discovery that there is some variance in the species diversity of each breed where bacterial populations can be influenced by diet, environmental factors, genetics, and age. Differences in the environment a canine was raised can have a major effect on a healthy microbiome, leading to an increased risk for infection of the intestinal tract. Dogs in home environments with routine care, space, and exposure to other animals and humans can have a different bacterial makeup in their gut microbiomes compared to mill-bred dogs. Canines that grow up in cramped spaces can develop alterations in their gut microbiomes due to high stress living situations, lack of environmental socialization, and space to grow. To learn more about the microbiome and the possible differences in bacteria involved, fecal samples of dogs raised in a home environment and mill-bred dogs were analyzed to identify differences between the bacterial species diversity, metabolic function, and genetic makeup of their gut microbiome. The comparison of these microbiomes will contribute to a better understanding of potential links between gastrointestinal issues observed in mill-dogs and differences in diversity or metabolic capability of these bacteria compared to canines in residential homes. Fecal samples were gathered from a local veterinary hospital and the genomic DNA was isolated and shipped to a laboratory for shotgun sequencing. Sequencing results allowed the abundance and species of bacteria present in the gut from these two groups to be determined alongside metabolic capabilities. Differences in bacteria found between the two groups can provide essential information to the veterinarian community about possible factors, such as stress, that can change canine microbiomes.

BOARD 6A

MAYA MOORE**EFFECTS OF LEAD ON PERFORMANCE MEASURES IN THE COMMON WALL LIZARD (PODARCIS MURALIS)**

Faculty Mentor: Eric Gangloff
Department of Biological Sciences

Living in urban environments presents many challenges to wildlife, including exposure to potentially toxic pollutants. For example, the heavy metal lead (Pb) introduces numerous health problems to various urban organisms, including humans. The little work that has been conducted on lead toxicity in reptiles suggests that lizards may be extraordinarily resilient to very high levels of lead pollution, by either avoiding or mitigating the toxicity. To assess the impact of lead exposure, we related performance and levels of lead in the blood in adult male common wall lizards (*Podarcis muralis*, N = 71) – a small reptile particularly capable of thriving in urban environments. We captured lizards from various locations across Cincinnati, Ohio, USA and quantified the concentration of lead in blood samples. We then tested two aspects of lizard performance important for survival: (1) Balance, a cognitively-demanding task, to assess the effect of lead on cognition (N = 41), and (2) Running endurance, a type of aerobic exercise dependent on oxygen (N = 43), to assess the impact of lead on blood oxygen-carrying capacity. We then used correlation analyses to quantify the relationship between lead levels and these ecologically-relevant performance measures. Lizards from roadside populations had higher blood lead concentrations than lizards from park habitats, and females had higher blood lead concentrations than males regardless of habitat type. There was no effect of blood lead levels on running endurance, but contrary to our predictions there was a slight positive effect on balance performance, whereby lizards with higher blood lead concentrations slipped less often than lizards with lower blood lead concentrations. Understanding the effects of lead toxicity and resilience in a particularly resistant animal could help us better respond to public health and environmental pollution concerns.

BOARD 6B

**PHUONG DINH
ARELI HERNANDEZ
SALMA KHETTAT
THY TRAN****ANALYSIS AND FORECAST OF THE HOUSEHOLD SECTOR**

Faculty Mentor: Goran Skosples
Department of Economics and Business

Our newsletters offer a comprehensive thought of the United States household sector's economic indicators. By examining data from the Chicago Fed National Activity Index (CFNAI), Personal Consumption Expenditures (PCE), Personal Income, and Real Retail Sales including Food and Beverage Service Sales, we provide an overview of the household sector's current state and future outlook. Our research was conducted during the Spring 2024 semester in ECON259. Our findings state that the CFNAI's role as a lagging indicator, reflecting broader economic trends. PCE acts as a leading indicator, with shifts in consumer spending patterns after economic change. Personal Income and Real Retail Sales and Food and Beverage Service Sales provide insights into consumer behavior and spending trends, which are crucial for understanding the household sector.

BOARD 7A

ASHLEY KRUMLAW

EXTERNAL PARASITES OF INVASIVE WALL LIZARDS

Faculty Mentor: Ramon Carreno
Department of Biological Sciences

Studying invasive species is important when it comes to understanding their effect on new environments, and it is just as important to study their parasites. A species of invasive wall lizard is being studied in Cincinnati, Ohio, and their external parasites are collected as part of that work. The purpose of this study is to figure out the species of the mites obtained from these lizards using genetic and morphological data. This is important work because by doing this we can figure out whether these lizards have brought their own parasites, or are being parasitized by a native species. The mites were collected by Dr. Gangloff and his students and stored in Ethanol. DNA was extracted using a DNEasy kit. PCR and gel electrophoresis was used to amplify and test the DNA before it was sent off to be analyzed. The exoskeletons of the mites were saved and stored in Ethanol to be used for morphology work. Once the results came back, the sequence data was edited and put through a BLAST program. The results of the genetic data indicate that these mites are from the Trombiculidae family, also known as Chiggers. Morphological work is still being done, including SEM imaging and key work, but we hope to narrow it down to the species level. Future work could include looking at other external parasites, and determining their effect on the lizards themselves.

BOARD 7B

LILLY COLBECK

"EXCELLENCE BECAUSE OF US": THE 2013 STRONGSVILLE TEACHERS STRIKE

Faculty Mentor: Xiaoming Chen
Department of History

This research seeks to provide a comprehensive summary of the 2013 Strongsville Teacher strike, and examine the arguments that sparked the conflict. Strongsville is a conservative-leaning, upper-middle class suburb of Cleveland, Ohio. Teachers had been negotiating the details of their upcoming contract with the school board for months before both sides gave their final, best offer- to no avail. On March 4, 2013, 385 teachers walked out of their classrooms to go on strike, leaving 6,400 students without educators. After eight grueling weeks, teachers walked away largely victorious in their negotiations, but the experience was not without consequences, both monetary and educational. Revisiting the strike's events a decade later, including the opinions and actions of the Strongsville City School Board, members of the Strongsville Education Association (SEA), union representatives, and the press, reveal an array of opinions that demonstrate the distance between pro-union and anti-union sentiments.

BOARD 8A

BOBBY FRANKFORT
KEVIN FRATZ
ISAAC HENRY
TRIP PIERCE

ECONOMIC INSIGHTS: INTERPRETING FINANCIAL SIGNALS IN THE MARKET

Faculty Mentor: Goran Skosples
 Department of Economics and Business

Stock market indices, consumer credit, 2 and 10 year treasury note yield, 30yr MBA Mortgage Rate tracker, serve as key indicators that collectively offer an in-depth view of the U.S. economy's health, particularly in terms of its interaction with the global market. We analyzed financial sector data during the Spring 2024 semester and the poster informs the audience about:

- the definitions of each variable that was analyzed.
- how variables are constructed and what they measure
- the historical patterns for each variable
- the usefulness of each variable to predict economic recessions
- the behavior of each variable with respect to the economic theory
- the limitations of using each variable to describe the state of the international sector
- the forecasted value of each variable

BOARD 8B

ALINE AGUILAR

AN OVERVIEW OF LOCAL FISH SPECIES INFECTED WITH PARASITIC NEMATODES (SPINITECTUS SPP.) FROM THE OLENTANGY RIVER, DELAWARE, OHIO

Faculty Mentor: Ramon Carreno
 Department of Biological Sciences

Local fish species, bluegill sunfish (*Lepomis macrochirus*) and green sunfish (*Lepomis cyanellus*), were collected and assessed for parasites in three locations across Delaware, Ohio. These included points along the Olentangy River: the Delaware Run (DEL), River Run Park (RVR), and the William Street Bridge (WSB). Sampling was carried out from August 2022 to December 2023. It was found that both species of sunfish, together with rock bass, orange-spotted sunfish, and northern sunfish were parasitized with *Spinitectus carolini* and *Spinitectus micracanthus*. Using data analysis and data visualization, this study found a peak of nematode presence between Feb. 2023 and May 2023, most presence of nematodes in WSB, a constant relationship between the presence of nematodes and mass of the fish, among other findings. This data will be used to further investigate the significance of *Spinitectus* parasitic infections in the local waterways of Delaware, Ohio.

BOARD 9A

IVAN VORE

HAWAIIAN BOBTAIL SQUID SYMBIONT INTERSPECIES COMPETITION IS MEDIATED BY A DIFFUSIBLE ANTIMICROBIAL AND THE TYPE VI SECRETION SYSTEM

Faculty Mentor: Andrea Suria

Department of Biological Sciences

Leisingera bacteria (phylum Alphaproteobacteria) are the dominant symbionts in the accessory nidamental gland (ANG) symbiosis of the Hawaiian bobtail squid, *Euprymna scolopes*. The ANG is a female reproductive gland which inoculates eggs with healthy microbiota to protect against pathogens during development. Microbiome species composition is hypothesized to have significant impacts on overall host health and reproductive success in *E. scolopes*. Species dominance is hypothesized to result from competition between symbionts during colonization. Previous research has shown an ANG symbiont, *Leisingera* sp. ANG-M7, expresses a diffusible antimicrobial compound (DAC) in vitro, which may allow it to compete with other strains in the host. However, genetic deactivation of DAC expression demonstrated persistent competitive activity. Another symbiont of *E. scolopes*, *Vibrio fischeri*, is known to use the Type VI Secretion System (T6SS), a toxin delivery system common in diverse bacterial species and habitats, as a killing mechanism during colonization of the squid light organ. Since two discrete T6SS gene clusters are present in *Leisingera* ANG-M7, we hypothesize that the T6SS may play a role in competitive activity in this strain. Key structural protein genes in the two T6SS clusters of ANG-M7 were disrupted individually in a mutant background that no longer expresses the DAC. The T6SS- strains were tested in an in vitro coinoculation assay against another ANG symbiont, *Leisingera* sp. ANG-DT, to screen for total loss of killing. Data from seven trials suggests that disruption of the T6SS-2 in ANG-M7 may lead to a slight decrease in inhibitory activity against ANG-DT. These data suggest that a third competitive mechanism may exist in ANG-M7, but the T6SS-2 may play a role in contact-dependent bacterial competition. Further research will require the generation of a triple mutant inhibiting both T6SS-1 and T6SS-2 within a DAC mutant background to discern additional significant competitive inhibitory mechanisms.

BOARD 9B

COLTON MOONE TIM ROOT ZORAN VUJAKLIJA

INSIGHTS INTO VARIABLES AFFECTING BUSINESSES

Faculty Mentor: Goran Skosples

Department of Economics and Business

Capital Utilization, Construction spending and durable (factory) goods serve as key indicators that collectively offer an in-depth view of the U.S. economy's health, particularly in terms of its interaction with businesses. We analyzed the business sector data during the Spring 2024 semester, and the poster informs the audience about:

- the definitions of each variable that was analyzed.
- how variables are constructed and what they measure
- the historical patterns for each variable · the usefulness of each variable to predict economic recessions
- the behavior of each variable with respect to the economic theory
- the limitations of using each variable to describe the state of the international sector
- the forecasted value of each variable

BOARD 10A

MALHAR CHAKRABARTI

FROM THERE TO HERE: THE ECONOMICS PHD PROGRAM RANK OF HIRES AT NON-PHD-GRANTING SCHOOLS

Faculty Mentors: Seth Gitter, Robert Gitter
Department of Economics and Business

Economics departments at more teaching-oriented schools suffer from a lack of information about the types of PhD programs from which similar schools hire from. Using a data set of over 650 Economics PhD placements at non-PhD-granting schools, we fill in this information gap. We find that the new assistant professors come from graduate economics programs with a mean U.S. News ranking around 45. Liberal arts schools tend to hire from more highly ranked programs and there was a positive relationship between the rank of the hiring school and the rank of the PhD school from which they hire. In recent years there has been a decline in the ranking of PhD programs that National Liberal Arts Colleges hired from and that top-ranked graduate programs are sending a smaller proportion of their graduates to teaching-oriented schools. There was no significant difference by gender in the probability of leaving a teaching-oriented job and liberal arts colleges that hire a candidate from a graduate program ranked 11-20 are more likely to retain the person they hire. National universities without a PhD program that hired a person from a top ten program were less likely to retain the person, ceterus paribus. With this additional data, hiring departments can better target their limited interview slots.

BOARD 1A

ARIANA BROWN
BRANDON EDWARDS
BROOKLYN UPP

CENTRAL OHIO EASTERN RED-BACKED SALAMANDERS (PLETHODON CINEREUS) DON'T FOLLOW THE RULES

Faculty Mentor: Eric Gangloff
Department of Biological Sciences

Lab experiments with Eastern Red Backed Salamanders (*Plethodon cinereus*) have found that these salamanders display complex social hierarchies, which play a role in their exhibition of territorial defense. Factors that appear to play a role in lab settings include sex, size, and age class. Here, we explore whether these lab findings translate to wild salamander populations in central Ohio. Using capture data collected from 19 surveys over three years at two sites with cover board arrays, we quantified female-female, male-male, and female-male co-occurrences. Importantly, we leveraged data on home range size and so counted co-occurrences as instances whereby salamanders were found within a ~1.25 m radius (N = 150 observed co-occurrences). In contrast to our predictions, we found that there was no difference in associations from random chance. We then tested the hypothesis that both sexes have mate size preferences by examining the correlation in snout-vent length of co-occurring individuals, but we found no relationship. Finally, we tested the hypothesis that juveniles are tolerated equally by both male and female adult salamanders. We examined juvenile co-occurrence with adult individuals and found that juveniles are equally likely to be found with adult male or female salamanders. Ultimately, these wild central Ohio salamander populations don't exhibit social associations as expected and behave generally in a way contrary to laboratory studies.

BOARD 1B

KAINAAT ASLAM
HAN MIL KIM
TASFIA RAHMAN
ZAHRA YAZDANI

ANALYSIS AND FORECAST OF LEADING INDICATORS IN INTERNATIONAL SECTORS

Faculty Mentor: Goran Skosples
Department of Economics and Business

In a globalized economy, the vitality of the U.S. economic landscape is intricately tied to its participation in international trade. Throughout the Spring 2024 semester, our meticulous research of U.S. International Trade in Goods and Services, the Broad Index of Foreign Exchange Rates, and the pivotal Global Brent Crude and WTI Prices, alongside comprehensive import and export statistics, provided a multi-faceted portrayal of global economy. This poster is designed to elucidate the nuances of international trade, imparting insights on the following dimensions:

- Precise definitions of each economic indicator under our lens.
- The methodological framework underpinning the construction and measurement of these variables.
- A retrospective examination of historical trends for each indicator, uncovering patterns and anomalies.
- Evaluation of the prognostic value of these variables in foreshadowing economic downturns, particularly recessions.
- Correlation of the empirical behavior of each variable with established economic theories.
- Critical analysis of the limitations inherent in utilizing these indicators to encapsulate the international sector's state.
- Projections and forecasts of future values for each indicator, synthesizing past data trends with current economic theories.

By integrating empirical data with theoretical constructs, our study not only reflects on the past and present intricacies of international trade but also suggests forecast towards future trajectories, thereby serving as a compass for economic policy and strategy formulation.

BOARD 2A

JACK ZIMMERMAN

REAL ESTATE PRICE FORECASTING WITH THE HYBRID SVM-PSO MODEL: A COMPARATIVE STUDY WITH TRADITIONAL FORECASTING MODELS

Faculty Mentor: Will Georgic
Department of Economics and Business

Real estate prices play a significant role in the dynamics of the economy, and accurate price forecasting is crucial to ensuring economic agents can make informed decisions. The recent popularity of machine learning algorithms to predict real estate prices has led to various discussions on methods and techniques. The support vector machine (SVM) model has proven to outperform other popular machine learning approaches, such as artificial neural networks (ANN) and classification and regression trees (CART). SVM is a highly generalizable machine learning method that can handle high-dimensional data. It has also been shown that further accuracy can be obtained by tuning the hyperparameters using particle swarm optimization (PSO). PSO is a widely used metaheuristic used for optimization. Such implementation is known as the hybrid SVM-PSO model. However, there is a lack of literature on the hybrid SVM-PSO model and its implementation within the context of real estate. Additionally, much of the current literature discusses implementing the hybrid SVM-PSO model to forecast real estate price indices, not the individual home prices themselves. Therefore, my study examines the implementation of the hybrid SVM-PSO model to predict individual home prices. The study uses data provided by Core Logic and consists of approximately 5 million observations and 200 variables. Preliminary results indicate that the SVM-PSO model has robust forecasting performance.

BOARD 2B

NATALIA MOLOTIEVSKIY

FEATHER-DEGRADING BACTERIA: SCREENING AND CHARACTERIZATION OF ISOLATES FROM MICROBIAL COLLECTIONS

Faculty Mentors: Andrea Suria, Laura Tuhela-Reuning
Department of Biological Sciences

Bird feathers can be incorporated into various products from agriculture, textiles, cosmetics, biomedicine, and environmental remediation, thus presenting a valuable opportunity for sustainable use. While previous studies have identified microbial communities capable of feather degradation, research on their enzymatic properties is still needed. Therefore, our study aimed to investigate the keratinolytic activity of bacteria isolated from avian feathers. OWU has a collection of over 3000 bacterial strains isolated from wild songbirds. Screening 50 bacterial strains for their feather-degrading capabilities involved qualitative assessment (observing the remaining feathers) and quantitative analysis (measuring oligopeptide levels). *Bacillus licheniformis* O.W.U.138B, known for its keratinase production and feather degradation capacity, was utilized as a control. Thus, on day seven, strain 4587T demonstrated the highest oligopeptide concentration, approximately 4.3 times greater than the lowest concentration observed. The control strain B138 exhibited an oligopeptide concentration approximately twice as high as the lowest recorded concentration. Keratinase activity varied considerably among the strains, with strain 5159B exhibiting the highest activity on the second day, reaching a concentration approximately ten times greater than the lowest concentration recorded for strain B138. Additionally, the assessment of percentage feather degradation based on featherweight loss on day four revealed 94% degradation for strain 5159B, 75.91% for the control strain B138, and 66.22% for strain 4587T. Physiological assessments of carbohydrate consumption and other biochemical traits showed metabolic variation between the strains, which could influence their keratinolytic activity. The bacterial strains were identified through the analysis of the 16S rRNA gene sequence. BLAST analysis revealed a high percentage of sequence homology with related entries in the NCBI GenBank, leading to the identification of the strains as *Bacillus cereus*, *B. subtilis*, and *B. licheniformis*. Further studies are needed to elucidate molecular mechanisms underlying keratin degradation and explore their applications in bioremediation and bioconversion processes.

BOARD 3A

GABI HENNIGAN
ELIZABETH POLLNER
SAMUEL ROBERTS

ECONOMICS OF ENERGY RESOURCES AND THE FED

Faculty Mentor: Goran Skosples
Department of Economics and Business

Our sector analyzes energy sources such as natural gas and crude oil production as well as the activity of the Chicago Fed activity. These factors serve as key indicators of the health of the U.S. economy. Specifically in terms of it he price fluctuations in both crude oil and natural gas sectors. We analyzed economic trends that affect the fluctuations in these sectors and how these changes in price affect the economy in turn. This is for our National Income and Business Cycles course in the Spring 2024 semester. The poster informs the audience about: Key indicators of fluctuations in Gasoline Prices. The affect the activity of the Chicago Fed has on natural resources. Crude Oil's relation to Gas Prices. The economic variables which affect these sectors such as current events.

BOARD 3B

ASHLEY BAHREY

EFFECT OF WARMING REGIONAL TEMPERATURES ON SUGAR CONCENTRATIONS IN ACER SACCHARUM SAP

Faculty Mentor: Laurel Anderson
Department of Biological Sciences

Aside from the implications that *Acer saccharum* (sugar maple) sap sweetness has for the continued success of the multi-billion dollar maple syrup industry, maple sugaring is also an ancient and culturally significant practice for many indigenous peoples. Furthermore, *Acer saccharum* is one of the most dominant species in Ohio tree stands and is the fourth most abundant tree species across the eastern United States. Yet, the impact of rising global temperatures on the sugar content of *A. saccharum* sap remains understudied. In this study, we examined the effect of increased regional temperature from 2018–2022 on *A. saccharum* sap sugar concentrations (Brix value) at Stratford Ecological Center. Based on the prior knowledge that higher temperatures are likely to facilitate respiration rates, we predicted that the average sweetness of *A. saccharum* sap would decrease as the temperature of the previous growing season increased. The findings of this study show that there is a significant negative linear relationship between mean yearly sugar content from 2019–2023 and mean regional temperature of the previous growing season (May–October). We found no significant correlation between yearly sugar content from 2019–2023 and mean precipitation of the previous growing season. However, the results of this study did show that the sugar content of sap measured throughout the 2024 season became significantly sweeter between the time of the first and last sample collection. Revisions to sugarbush maintenance practices of producers in the maple syrup industry as well as the health and carbon sequestration capability of *A. saccharum* generally may be informed by our finding that warming results in decreased sap sugar content.

BOARD 4A

LILY BECHINA

OMEGA BLOCKING ON THE GREENLAND ICE SHEET

Faculty Mentor: Nathan Rowley
Department of Environment and Sustainability

The Greenland Ice Sheet (GrIS) is the second largest ice mass in the world and, due to climatic changes, is experiencing increasing melt – and subsequent sea level rise. There are many factors that contribute to this enhanced melt, including downsloping – or foehn – winds. When air descends down a land mass, their temperature increases until they reach equilibrium with the warmer air around them. However, there are instances in which air will continue to move downslope and surpass equilibrium, primarily driven by a pressure gradient. A unique pattern – the Omega Block – is characterized as a high pressure center over the GrIS surrounded by two low pressure centers to the west (Baffin Island) and east (Icelandic Low). As air circulates around this pressure pattern, wind distribution creates an omega-shaped wind flow. Along the western margin of the GrIS, during an omega pattern, winds traveling from the ice sheet interior – understood to be extremely cold (near -40°C) – can produce anomalously high temperatures at the coast, which is counterintuitive. This work seeks to fully understand the mechanisms behind this phenomenon by analyzing dates corresponding to anomalously warm conditions (1 and 2 sigma warmer than normal) during our nearly 30-year study period. We use matlab to process automated weather station (AWS) data across six AWS stations in western Greenland. We identify a list of dates where a majority of AWS identify anomalously-warm dates. We hypothesize that during these warm periods, we will identify an omega blocking pattern, with easterly winds and the distribution of High and Low pressure systems as described above.

BOARD 4B

SHAE KLINE

MONITORING THE PHENOLOGY OF TREES AND SPOTTED SALAMANDERS IN A VERNAL POOL

Faculty Mentor: Laurel Anderson
Department of Biological Sciences

Ecosystems and the organisms that live in them are extremely sensitive to the effects of climate change, especially indicator species such as amphibians. *Ambystoma maculatum* (spotted salamander) is an important species for monitoring environmental status because of its sensitivity to habitat changes. In tandem, climate change is altering tree phenology, which changes the timing of vital processes like leaf emergence and blooming. In this study, I monitored *Quercus palustris* (Pin Oak), *Fagus grandifolia* (American Beech) trees, and *Cephalanthus occidentalis* (Button Bush) around a vernal pool at Stratford Ecological Center near Delaware, OH. This work is part of a larger, multi-site project run by the Ecological Research as Education Network (EREN) to see if the species associated with vernal pools are responding to climate change with coordinated shifts in phenology or responding independently. Independent responses could lead to tree leaves shading developing salamander eggs or larvae earlier in development, which could affect the speed of development with cooler temperatures in the pool, the photosynthetic activities of symbiotic algae that provide salamander eggs with oxygen, and/or the food webs that support hatched salamander larvae. Sperm packets left by male salamanders were first observed on March 12. As of April 4, 2024 no salamander eggs or leaf out from overstory trees have been observed. This is similar to the phenological timing observed in 2022 and 2023 for egg presence and leaf out.

BOARD 5A

HENRY HINKLE
LANDON KUHN
PRANAY MUNIYAPPA
RYAN SMUDZ

MACROECONOMIC INDICATORS FOR THE BUSINESS SECTOR

Faculty Mentor: Goran Skosples
Department of Economics and Business

We analyzed the economic indicators: Leading Economic Index, Total Vehicle Sales, Inventory to sales ratio and Small Business Index. All of these indicators serve to help businesses be aware of what is going on with our economic state. The variables we researched are a mix of both leading and lagging indicators. Total Vehicle sales have increased each month, reflecting an increase in consumer demand and economic growth. The Small Business Index and the Leading Economic Index have decreased since we last visited them, showing less optimism within small businesses and not a great outlook for the economy in future months. The inventory to sales ratio was flat, showing no change in that indicator. Our poster is going to provide insights on how each variable is created, what they are, historical data and patterns, the usefulness of the variables, how they behave in theory, forecasted values and the limitations of each variable.

BOARD 5B

ETHAN NICKLES

IMPORTANCE OF NATURAL HISTORY MUSEUM COLLECTIONS: UNVEILING NOVEL NEMATODE PARASITES IN SEYCHELLES CAECILIANS

Faculty Mentor: Ramon Carreno
Department of Biological Sciences

Caecilian (*Grandisonia alternans*) specimens from the Seychelles Islands that were collected in the 1950s were acquired by the OWU Natural History Museum. Several of these preserved amphibians were surveyed for parasites. Gut contents were extracted and carefully searched, resulting in the discovery of two types of nematode parasitic worms. Both are apparently undescribed nematode species. One of them is a *Raillietnema* species of which others have been reported in amphibians around the world. The other is a trichostrongyloid species that represents a new record for caecilians. Research is underway to characterize the new species for formal description. This underscores the significance of museum collections in contributing to scientific knowledge. The discovery highlights the importance of maintaining and documenting natural history specimens in museums, as it allows for the identification of new species and contributes valuable scientific information.

BOARD 6A

**ARAGELI ALLO
CARLOS COELLO
GIOVANNA LACARRAUBBA****DEMYSTIFYING INFLATION MEASURES:
A COMPARATIVE STUDY**

Faculty Mentor: Goran Skosples
Department of Economics and Business

Inflation significantly impacts decision-making across various sectors. This newsletter analyzes key inflation measures - the Consumer Price Index (CPI), Producer Price Index (PPI), and Personal Consumption Expenditures (PCE) price index. It explains their calculation methods, their unique strengths and limitations, and potential for offering contrasting conclusions. Additionally, the analysis incorporates inflation expectations data from the Cleveland Fed and Michigan surveys, providing insights into how consumers and businesses anticipate future price changes. This comparative study clarifies inflation measurement and its broader implications.

BOARD 6B

**NURI CRAIG
JASMYN ZIMMERMAN****THE ERASURE OF BLACK WOMEN AND
BLACK PEOPLE IN SOUTH AFRICAN
WILDLIFE CONSERVATION, OBSERVATION
OF FOOD RELATIONS AND SOURCES IN
LESOTHO/SOUTH AFRICA**

Faculty Mentor: Dawn Chisebe
Department of Africana, Gender, & Identity
Studies

This project represents the combination of two DEI grant-funded research topics. The first research project compared food production, marketing, and advertising practices between Lesotho and the U.S., examining their potential impact on fostering healthier dietary habits and cultural appreciation. Through visits to marketplaces and engagement with locals, the aim was to observe food consumption patterns, cultural significance, and water sanitation practices in Lesotho. Special attention was given to the role of women in marketplace leadership and the effects of colonialism on food culture. The ultimate goal was to challenge stereotypes, promote cultural understanding, and engage students in Black world studies. The second project aimed to explore the historical exclusion of Black people, particularly Black women, from conservation efforts in South Africa, focusing on Kruger National Park. During the colonial period, indigenous communities were forcibly displaced from their ancestral lands to establish wildlife reserves like Kruger. This displacement marginalized indigenous peoples and perpetuated racial segregation, evident during apartheid when access to the park was restricted based on race. While recent efforts have been made to address these legacies through community-based conservation initiatives and land restitution, challenges persist in reconciling conservation objectives with the rights and needs of indigenous peoples. Through interviews and observational work, this project sought to determine the extent of representation of Black men and women in the parks and the connection between Kruger National Park and local communities,

BOARD 7A

MINDI KLAUS

ANTIBIOTIC RESISTANCE IN BACTERIAL ISOLATES FROM PLAYGROUNDS IN A DRY VS. HUMID CLIMATE

Faculty Mentor: Laura Tuhela-Reuning
Department of Biological Sciences

Antibiotic resistance is a global issue that threatens the efficacy of medical care. Being aware of its effects and understanding the true scope of the crisis is vital to trying to stop it. In this study, playgrounds in a humid versus a dry climate were swabbed for bacteria and tested for antibiotic resistance. Playgrounds are frequented by children and, in theory, could result in an area of transmission for bacterial disease. Not only is it important to understand what bacteria are on playgrounds, but it is important to see if they are a risk for the spread of antibiotic resistance or for the spread of disease that is difficult to treat. In this study, three playgrounds around the Columbus area were swabbed. At each playground, a swing, a rail on the equipment, and a bench was swabbed and plated onto nutrient agar, mannitol salt agar (MSA), and eosin methylene blue. The first was to check for growth in general, the second to isolate *Staphylococcus* species, and the third to check for *E. coli*. This process was then repeated at three playgrounds in the Tempe area. From the plates, bacterial colonies were isolated and grown in pure culture, resulting in around sixty isolates. It is believed that *Staphylococcus* species were isolated in Ohio, but the MSA plates did not grow in Arizona. No *E. coli* was isolated. These isolates were then plated on Mueller Hinton agar with twelve different antibiotics, including oxacillin and ampicillin, to test for antibiotic resistance in a Kirby Bauer test. These results qualitatively showed a large amount of antibiotic resistance; however, quantitative analysis has yet to be performed. At this time, the results indicate that antibiotic resistance can be found in bacterial isolates from playgrounds in both a humid and dry climate.

BOARD 7B

MEREDITH FRYMYER

WAR AND FISH: A LEGAL HISTORY OF THE FISH WARS

Faculty Mentor: Xiaoming Chen
Department of History

In the 1970s, various Indigenous nations of the Pacific Northwest sought to maintain their treaty rights and continue to fish on their ancestral lands. These so-called Fish Wars were a series of Fish-Ins and protests organized by tribal members to expose the predatory behavior of the state of Washington as it attempted to eliminate Indigenous presence in the fishing industry. These protests reveal a much larger, nearly 100-year struggle by Indigenous tribes to convince the state and federal government to recognize and protect their fishing rights and privileges – provided for via treaty. This project is a detailed account of the Fish Wars as a distinct social movement. It is also a lengthy legal history, with a thorough analysis of cases and precedents. It argues the crucial additions to legal precedent would not have been possible without the general climate of the 1970s, in addition to the political presence of the American Indian Movement.

BOARD 8A

PAYTON ANDISMAN

EFFECTS OF POST-HARVEST PREPARATION PROCESSES ON ANTIMICROBIAL PROPERTIES OF MEDICINAL PLANT TISSUES

Faculty Mentor: Laurel Anderson
Department of Biological Sciences

This study will be conducted on a selection of plant species that have been previously documented to exhibit antibacterial properties. The species that will be tested are *Allium tricoccum* and *Echinacea purpurea*. *E. purpurea* will be grown from seed in the laboratory greenhouse, while *A. tricoccum* will be harvested from the local environment. The purpose of this study will be to examine the efficacy of these historically medicinal plants when processed through different conditions of processing for medicinal use post-harvest. The bacterial inhibition zone of the selected plant species will be tested, in replicates, with freshly harvested plant tissue and again tested after following a standardized drying procedure to search for differences in inhibitory ability based on preparatory methods. The results of this study will have implications towards understanding the most effective approach to properly using plant tissues with antibiotic properties in the field of medicinal botany.

BOARD 8B

ANUBHAV RAGHAV

FUELING THE FUTURE: A MACROECONOMIC ANALYSIS OF US GASOLINE PRICES AND VEHICLE SALES TRENDS

Faculty Mentor: Goran Skosples
Department of Economics and Business

This project examines two significant economic indicators: US Gasoline Prices and Total Vehicle Sales in the US, which are important in assessing both consumer behavior and macroeconomic health. This analysis provides a nuanced understanding of how fluctuations in US Gasoline Prices are influenced by various factors including global oil market dynamics and domestic policy decisions. It explores the consequential impact of these prices on consumer expenditure and broader economic sectors, particularly transportation. Furthermore, the project dives in the Total Vehicle Sales (US) as an important variable of economic vitality and consumer confidence. It details the correlation between sales figures and economic cycles, while also considering the burgeoning influence of electric vehicles on these traditional metrics. The interaction between gasoline prices and vehicle sales reveals significant insights into consumer preferences and the automotive market's adaptability to shifting economic landscapes. Methodologically, this project integrates historical data review, modeling, and theoretical economic analysis to forecast future movements of these variables under various economic scenarios. The project not only highlights the academic and policy-making utility of these indicators but also addresses their direct relevance to the everyday consumer. For instance, understanding gasoline pricing is essential for household budgeting as it directly affects commuting costs and discretionary spending. Finally, the project identifies limitations inherent in forecasting based solely on these variables, suggests additional factors for a more comprehensive analysis, enhances the predictive accuracy of economic downturns and recovery phases, thereby aiding stakeholders in making informed decisions.

ORAL PRESENTATION - 4:20-4:40 PM

JOEL ZACHARY

THE STRUGGLE OF BEING A JEWISH AUTHOR

Faculty Mentor: Amy Butcher,
Department of English

My project aims to discuss the struggle of being a Jewish Author in America while going through subjects like Jewish Trauma, discussing difficult topics that range from a post Holocaust world to the prejudice, whether internalize or external against members of the Jewish Faith in America, and issues that Jewish authors face in a modern society. This all stems from my deep commitment to being a Jew in today's modern society and refusing to let my faith and ideals wither away silently. This project was inspired by going to a panel at the Kansas City Writing Conference entitled "Writing Jewish Trauma". I was inspired to take notes throughout the panel and further research by contacting other Jewish members of the writing community and chatted with them at length in order to research more. This project aims to unpack Jewish trauma coming through in writing whether it be subconsciously through family trauma or consciously due to feeling the oppression of American society.

ORAL PRESENTATION - 4:40-5:00 PM

SOPHIA GIPSON

AN ANALYSIS OF THE IMPACT OF TOURISM ON HOUSING IN SAVANNAH, GA

Faculty Mentor: Paul Dean
Department of Sociology-Anthropology

The topic of housing in the broader context of the United States has become increasingly important to pay attention to as rising costs of living are impacting everyone. With rising costs of construction, fewer affordable housing options are being built, millions are being priced out of ownership and rentals, and unsheltered homelessness continues to rise. According to Harvard University's Joint Center for Housing Studies, first-time home buying dipped significantly in the second half of 2022 in response to the average monthly home payment rising from \$2,200 in January, to \$3,100 in October. While the City of Savannah has been no stranger to economic prosperity, shown today in the form of historical homes and landmarks, they haven't been exempt from the ongoing national housing shortage. However, with Savannah's economy being bolstered largely by tourism, with revenue increasing from \$2.67 billion in 2015 to \$4.4 billion in 2022, housing accessibility has been diminished further by the short term vacation rental industry. As a result, housing has become increasingly unaffordable and inaccessible as more homes are actively being converted into short term rentals, driving up the cost of the remaining surrounding available housing. Through my awarded funds I was able to travel independently to Savannah, GA for four days to interview civic leaders and local residents about their perspectives on how they view tourism is shaping and altering their communities. Through my informal interviews and conversations from a variety of lived experiences, I discovered that city officials are hyper aware of the problems Savannah is grappling with, local and non-governmental organizations collaborate closely with residents to advocate for change, and residents themselves have a relatively positive relationship with tourists. Something I was not expecting was the hostile relationship between locals and the Savannah College of Art and Design (SCAD) due to the burden they place on public infrastructure and the available housing stock. My presentation will briefly review the problem on a national level, present my methods and findings, and conclude with what city officials and locals are doing to solve the problem.

ORAL PRESENTATION - 5:00-5:20 PM

FAITH DESCHAMPS

DECOLONIZING MONOPOLY

Faculty Mentor: Veda Hyunjin Kim
Department of Sociology–Anthropology

Abolitionist teaching is not sustainable without joy” (Love 2019: 120). In this paper, we propose a joyful classroom activity in which undergraduate students rewrite the character identities in the game Monopoly to bring to the forefront the lived experiences of people with a variety of intersectional identities in US society. In the game manual recreated by our abolitionist efforts, we describe the methods by which students play a game to learn about and reflect on social processes that create identity differences, inequality, and abolitionist solidarity. This way, we aim to decolonize not only Monopoly but also the presence of sexist, homophobic, racist, classist, and other destructive hatreds (Shrewsbury 1987: 6). During our reconstruction activities, we were insistent on feminist pedagogical principles in that there is shared power in the learning endeavor as the experience is equally shaped by students and professors. In other words, this game is explicitly designed to forefront the diverse experiences of participants having identity differences in racial, gender, and classroom status. Our differences were the “categories of connection,” making us stronger in solidarity, as Patricia Hill Collins (1993: 42) noted. By far, we have created the following eight characters: 1) Jill Doe, an average white woman; 2) Brenda Weller, a white single mother; 3) Alan Mousk-Morgan, a capitalist white man; 4) Carla Marcks, a fake social justice warrior with an upper-class background; 5) Donald Biden, an average politician; 6) Kia Boys, a young and poor man of color with a criminal record; 7) Lord Landlord, a middle-class landlord; and 8) Mika Immigrant, an undocumented immigrant single mother of color. Each of these eight characters has differing starting funds, salary (game money acquisition when passing Go), and sets of Community Chest cards. Moreover, each character has different advantages and disadvantages.

ORAL PRESENTATION - 5:20-5:40 PM

CHANDLER CARR

THE CAUSES AND CONSEQUENCES OF NEST VARIATION IN A FREE-LIVING SONGBIRD

Faculty Mentor: Dustin Reichard
Department of Biological Sciences

Construction behaviour is an aspect of the extended phenotype that allows organisms to build structures that alter their environments in potentially beneficial ways. Although individuals vary in the expression of this extended phenotype (e.g., structure morphology), the repeatability of construction behaviour remains understudied, especially among free-living populations. Many oviparous taxa construct nests, making them of particular interest because variation in nest architecture may directly affect fitness. Using a free-living, cavity-nesting songbird, the northern house wren (*Troglodytes aedon aedon*), as our model, we estimated the contribution of the primary builder (the female) to nest variability by measuring the repeatability of nest morphology between successive clutches. We further examined whether nest morphology was related to the dimensions of the nesting cavity, breeding date, or nest success. We found the composition of the cup lining to be a highly repeatable behaviour for the nesting female, although the size and composition of the structural platform appeared more related to the dimensions of the cavity. Despite the expectation that construction effort would show a seasonal decline, similar to clutch size in this species, nest morphology remained incredibly variable throughout the breeding season and was unrelated to the survival of the offspring. Our study suggests that variation in construction behaviours is a product of multiple factors including the preferences of the builder and physical constraints. The absence of any clear links between construction behaviour and fitness indicates that nest morphology is not under strong selection. As a result, diverse female building preferences may explain the extreme among-individual variation in nest structure in this species.

ORAL PRESENTATION – 5:40–6:00 PM

ZOË SWANSON

PERSONALITY AND PLASTICITY IN NEST DEFENSE OF FEMALE HOUSE WRENS (TROGLODYTES AEDON)

Faculty Mentor: Dustin Reichard,
Department of Biological Sciences

Reproductive success can be highly dependent on predation pressure and the effectiveness of parental antipredator behavior. Parents often have variable responses to predators based on the threat level presented, both to the parents directly or to the offspring. Here, we assessed if the behavioral responses of female House Wrens (*Troglodytes aedon aedon*) were repeatable across different predation contexts, which is expected if a personality is present. House Wrens are a cavity-nesting songbird predated by birds of prey, snakes, and small mammals. Over three breeding seasons, we placed a decoy of a common nest predator, the eastern rat snake (*Pantherophis alleghaniensis*), on top of nest boxes and measured female nest defense behaviors. Each season, we also presented a second stimulus of varying threat levels, including an Eastern Chipmunk decoy (*Tamias striatus*), a taxidermied Cooper's Hawk (*Accipiter cooperii*), and a set of large, white car dice, which served as a novel object to assess boldness. We compared female behavior within and among individuals, as well as across years when responding to the same predator. There was limited evidence that the nest defensive behaviors of the female house wrens were repeatable within or among individuals, which was not indicative of a clear personality. We did note significant repeatability and correlations between responses to the snake and chipmunk decoys, which may be explained by the similar threat level posed to the offspring and parents by those stimuli. Finally, when comparing female responses to the same predator across years, we found significant consistency in behavior at the population level. Future tests should include sampling individual females multiple times with each stimulus to more effectively test for the presence of a personality.

ORAL PRESENTATION – 4:20–4:40 PM

ANNA NACCI

ABORTION ISSUE KNOWLEDGE, PRIORITIZATION, AND ACTION: A CROSS-NATIONAL ANALYSIS OF HOW POLITICAL BEHAVIOR IS MOTIVATED IN THE UNITED STATES AND IRELAND

Faculty Mentor: Franchesca Nestor
Department of Politics and Government

On June 24, 2022, the U.S. Supreme Court released the decision of *Dobbs v. Jackson*, a landmark ruling that changed the precedent on abortion law, overturning *Roe v. Wade* and concluding that individual states may make legislative decisions about the legality of abortion. Ireland experienced its own historic legal change on May 25, 2018, when abortion became legal nationally through a citizen referendum. Abortion was previously illegal according to the Eighth Amendment of the Irish Constitution, which required that the life of the fetus be held as equally important as the life of the pregnant person. Through a survey taken by 143 OWU students in the fall of 2023, and interviews conducted with activists, scholars, and students in Ireland in February 2024, this study aims to measure how political knowledge and issue prioritization motivate civic engagement and inform voting behavior, specifically around the time of elections that have a large impact on the status of abortion rights. The results of the survey show that OWU students are generally uninformed about the specifics of abortion as a medical procedure, as well as the laws governing it. Despite this lack of knowledge, the issue continues to be a priority, with participants indicating that it is the most important issue in dictating their political views, and those that voted indicating that it was the most important issue in their decision of whether or not to vote in the 2022 midterm elections, as well as which candidate to support. The insights from the interviews conducted in Ireland show similar patterns, sharing that college students in Ireland are not generally informed about the issue of abortion. Additionally, they explained that even citizens that had little prior political experience or knowledge were emboldened to participate in the movement to legalize abortion in 2018.

ORAL PRESENTATION – 4:40–5:00 PM

GABRIELLE DEACON

THE TRAUMA OF DIGITALIZATION

Faculty Mentor: Kristina Bogdanov
Department of Fine Arts

The Trauma of Digitalization has been my exploration, through visual art, of unrestricted internet access and how it has influenced people's perceptions of sex and relationships. The goals of the show are to understand sex education, or lack of it in Western society, break down the taboos within having conversations about sex, and push the viewer to recognize the promotions of sex in advertising and media in daily life. The body of work consists of pieces juxtaposing childhood and pornographic imagery, bringing awareness to the categorization of women in pornography, and visualizing stereotypes and harmful sexual practices. These pieces were created in a variety of mediums, from oil paintings to hand-bound books, in order to specifically introduce wires and other technological elements. By observing pornography through a feminist lens I have been able to learn about the intersectionality within the industry and how it has contributed to sexual racism and sexism.

ORAL PRESENTATION – 5:00–5:20 PM

CARLY SANDERS

ETHNOBOTANY AND ENSLAVEMENT: ERASURE OF BLACK HERBAL MEDICINE USE IN THE DIASPORA

Faculty Mentors: Laurie Anderson
Department of Biological Sciences
Dawn Chisebe
Department of Africana, Gender & Identity
Studies

Herbal medicine accounts for most medical treatment in “developing” nations but is largely underutilized in the United States. While herbal medicine has been used by several groups of people throughout history, people enslaved from West and West Central Africa who were brought to the Americas have a rich history of medicinal practices that incorporate plants. This knowledge was strongly informed by the medicinal uses of African plants but was applied to plants in the Americas when these people were brought from Africa. Some of the plants they utilized were previously known to be of medicinal value by Native Americans or European Americans and others were used for medicinal purposes only by enslaved people. However, the use of herbal medicine by enslaved people has largely been erased, contributing to the strong preference towards “Western” medicine in the United States. The anti-Black racism that surrounds herbal medicine and the safety and efficacy of herbal medicine are just two hypotheses that may explain the reasoning behind this erasure. These hypotheses were investigated through a literature review of information on herbal medicine in the United States and through travel to Ghana, where the majority of data was collected by means of conversations and interviews with researchers and practitioners of herbal medicine. Overall, this investigation led to the conclusion that the safety and efficacy of herbal medicine are questioned because these concerns have been historically perpetuated through an anti-Black lens, meaning that anti-Blackness is the main contributor to the erasure of Black herbal medicine in the United States. Acknowledging this erasure and its reasoning is necessary to provide credit to indigenous practitioners of herbal medicine who originated these practices and to protect their knowledge from both erasure and exploitation moving forward.

ORAL PRESENTATION – 5:20–5:40 PM

SARA BIAS MCKENNA TUTTLE

DIFFERENCES IN CORE MUSCLE ELECTROMYOGRAPHIC ACTIVITY DURING UNILATERAL AND BILATERAL CARRIES

Faculty Mentor: Andrew Busch
Department of Health & Human Kinetics

College athletes participate in lifting programs that often utilize core exercises to challenge the postural stability of the athletes with the intent of improving their abdominal wall muscle endurance and overall strength. This research was to determine if there is a difference in electromyography (EMG) within core musculature during unilateral and bilateral farmers carry. This study examined thirty-two healthy male, Division III collegiate athletes (age = 19.54 ± 1.06 years, height = 178.62 ± 5.58 cm, weight = 83.11 ± 13.27 kg) from Ohio Wesleyan University. Each athlete performed a max voluntary isometric contraction (MVIC) of their rectus abdominis (RA), external oblique (EO), and erector spinae (ES). Subjects then completed three different types of farmer carry holds including a bilateral (BL), contralateral (CL) and ipsilateral (IL) carry using two different weights, 25% body weight (BW) and 12.5% BW in random order. For all three abdominal muscles recorded, there was a statistically significant two way interaction between the weight used and type of carry. When comparing weight used during the CL carries, the 25% BW elicited treated EMG activity by the means calculated. All carry types created greater EMG activity in RA, EO, and ES during 25% BW compared to 12.5% BW carries. CL farmers carry produced greater EMG activity in abdominal muscles when compared to IL and BL.

ORAL PRESENTATION - 4:20-4:40 PM

ZOIE POIS

THE LOSS OF EARTH

Faculty Mentor: Laurel Anderson
Department of Biological Sciences

The loss of nature has accelerated in recent years, unfolding before our eyes. As humanity expands its global footprint, driven by unchecked unsustainable practices, intricate ecological webs that have taken millennia to form unravel. Environmental loss can go far beyond the surface, affecting human health, heritage, and livelihoods. Materials related to climate change and its various impacts were analyzed to fulfill the research portion of the study. *All We Can Save* is a compilation of illuminating essays, poems, and artwork by women at the forefront of the climate movement. The book highlights the main ideas that focus on advocating, reframing, and persisting within the climate movement. A journal entry was completed to commend and examine the work in response to each chapter. In addition to a journal entry, a piece of artwork was created to embody the main messages of the chapters. The loss of elements within the environment is a topic that resonates across generations. Oceans are rising, species are dying, and livelihoods are at risk, yet some still dismiss the climate movement. In today's day and age, the profound lessons nature offers have faded into the background, interfering with the development of empathy, curiosity, and ecological awareness. The artwork created in this study is a poignant reflection of the loss of environmental experiences, as each presented panel has a missing layer. Watercolor was utilized to illustrate how nurture may fade from our lives. In addition, sounds that gradually disappear were implemented to enhance the disappearance experience and engage multiple senses, evoking a sense of loss and urgency. Sometimes, presenting people with facts and data is ineffective. The goal of each art piece is to elicit an emotional response from the audience, drawing their attention to everyday experiences that could disappear if the climate movement is not taken seriously.

ORAL PRESENTATION - 4:40-5:00 PM

MUHAMMAD ARSHAD SHLOK MUNDHRA DHRUV SEKHAWAT

COMPREHENSIVE ANALYSIS OF ECONOMIC INDICATORS: INSIGHTS INTO CONSUMER BEHAVIOR, ENERGY DYNAMICS, AND MARKET TRENDS

Faculty Mentor: Goran Skosples
Department of Economics and Business

This document delves into a meticulous examination of pivotal economic indicators, providing a holistic overview of the current state and future trajectory of the U.S. economy. By dissecting various sectors, including energy prices, vehicle sales, manufacturing output, and retail health, it furnishes stakeholders with critical insights into consumer spending patterns, economic activity, and potential market shifts. The analysis begins with a focus on U.S. Regular Gasoline Prices, highlighting their role in reflecting consumer spending and inflation trends, with a recent uptick signaling potential shifts in demand or supply constraints. It then transitions to Total Vehicle Sales, underscoring their significance in gauging consumer demand and the automotive industry's health, revealing a resilient market with a penchant for electric and autonomous vehicles. The narrative further explores the Chicago Fed National Activity Index (CFNAI) and the Redbook Index, which collectively offer a macroeconomic perspective and immediate insight into retail health and consumer spending stability, respectively. Additionally, the examination of U.S. Crude Oil Production provides a lens into the energy sector's dynamics, underscoring its impact on economic indicators and forecasting slight variations in production levels. The document synthesizes these indicators to present a narrative of cautious optimism, emphasizing the importance of monitoring trends across consumer behavior, energy markets, and overall economic health for informed decision-making and strategic planning. Through this comprehensive analysis, it aims to equip policymakers, business leaders, and economic analysts with the knowledge needed to navigate the complexities of the market, predict future trends, and strategize accordingly.

ORAL PRESENTATION - 5:00-5:20 PM

ALLISON DIETZ BRIANNA MONTGOMERY

TRANSFORMATIONAL LEARNING: IS YOUR EDUCATION TRANSFORMING YOU?

Faculty Mentor: Cliff Hurst
Department of Economics and Business

Ohio Wesleyan promises to provide transformative experiences within its education. Does college change the way our students think? What does Ohio Wesleyan mean by “transformative education”? More importantly, how do we know that we are delivering on that promise? We are not alone in pursuing this. The Coalition for Transformational Education’s goal is “to ensure that all students who enroll in college not only complete a degree but also have a transforming educational experience that enhances their well-being and work engagement throughout life.” Universities that have joined the Coalition for Transformational Education have attempted to measure the impacts of their education by voluntary survey. Their survey techniques are based on an individual’s cognitive intuition, representing surface awareness. Surveys such as these primarily measure identity, agency, and purpose by level of well-being. The effectiveness of Ohio Wesleyan’s Transformational Education can best be measured through the Hartman Value Profile. The Hartman Value Profile is an assessment tool that quantifies and measures deep-seated values. This method can assess whether students are being transformed in the way they think, not just in their consciously held thought patterns. This test would be administered along with the Metacognitive Awareness Inventory, which measures consciously held thought patterns through questions on how a person thinks and learns. Administering both tests allows the determination to be made of whether there is a difference between subconsciously held beliefs and conscious beliefs. With a 4-year long longitudinal study, we seek to identify whether an Ohio Wesleyan University Education changes those deep-seated thought patterns measured by the Hartman Value Profile. Then, we can provide quantitative evidence to decipher if we are fulfilling our promise.

ORAL PRESENTATION - 5:20-5:40 PM

JENNA NAHHAS

ANDALUSIAN POETRY: A HISTORICAL EXPLORATION AND CREATIVE RESPONSE

Faculty Mentor: Patricia DeMarco
Department of English

The research project Andalusian Poetry: A Historical Exploration and Creative Response consists of two parts. First, a history of Andalusian poets and their poetic forms establishes the political and religious landscape. Second, a collection of original poetry adopts the Andalusian practice of emulation of traditional texts within a modern, American context. Poetry is like baklava: the honey syrup of the poets’s favorite music and books, the chopped pistachio of their personal experiences, the phyllo dough layers of their language, and the unique touch of lemon from their friends and family. All poetry exists as a response, whether the poet makes conscious decisions to innovate or emulate or whether they are only marginally aware of their influences. In Andalusia, the medieval Muslim-ruled Iberian peninsula, poetic emulation (mu’arada) was a genre in which poets used, responded to, and inverted preexisting poems in their own work. The goal of an emulation is a new work creatively and consciously fueled by the formula of another poem, whether that means borrowing the entire recipe or just the baking temperature. The purpose of this project is to provide a cohesive overview of Andalusian poetry in order to produce an intellectually and creatively rigorous response. Some of the poems are direct emulations, while others respond directly to no specific work but rather fall under a broader “literate response” to a close study of medieval Arabic poetry in Andalusia. The practice of emulation will produce a greater understanding of the region and its cultural makeup, building connections between historical and modern experiences of diaspora, religious experience, and cross-cultural encounters.

ORAL PRESENTATION – 5:40–6:00 PM

HELENA VON SADOVSKY

EXCLUSIONS OF CHIVALRY: AN EXPLORATION OF HOW THE ENEMY IS DEMONIZED OR HEROIZED IN DEPICTIONS OF THE THIRD CRUSADE

Faculty Mentor: Patricia DeMarco
Department of English

To what extent was there an extant archetype of “the Muslim Knight” in European medieval crusade literature, and how does this potential archetype inform the popular characterization of the thirteenth-century Ayyubid leader Saladin. As many critics have demonstrated, medieval French and English texts often depicted Muslim characters in crusader texts and illustrations as the monstrous “other.” Nevertheless Muslim warriors are sometimes ascribed chivalric characteristics similar to those displayed by Latin-Christian knights in chivalric literature. Especially in depictions of the third crusade (1187–1192), a variety of literary and art historical sources, particularly those concerning Saladin, and Sir Palomides in the Arthurian tradition depict Muslims with similar tropes and chivalric characteristics as they engage in conflict with Christians.

This project offers in-depth discussion of Muslim figures, usually combatants dressed in armor, in three art historical sources, including three manuscript illuminations. Special attention will be paid to the armor that is worn and it will be compared and contrasted with historical examples and other literary and art historical examples of armor being used as markers of morality. Secondly, this presentation will compare and contrast the portrait of explicitly Muslim knights with the depiction of Saladin.

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