



CELEBRATION OF
**SCHOLARSHIP
& CREATIVITY**



WORCESTER
STATE
UNIVERSITY

2024

2024 Panel Presentation Schedule

Time	Location	Presentation 1	Presentation 2	Presentation 3
8:30-9:20	Foster Room	Life After Mass Atrocities: A Psychological Perspective on Reparations Andja Kola <i>Advisor:</i> Henry C. Theriault, Ph.D.	Reparations for Forced Sterilization in the United States Morgan Stelmokas <i>Advisor:</i> Henry C. Theriault, Ph.D.	Canadian Residential Schools: Addressing the Past Grace M. Beckman <i>Advisor:</i> Henry C. Theriault, Ph.D.
	Fallon Room	Is There a Change in Flowering Time of New England Wildflowers? Alexis Doko; Mackenzie Vollmer; Anna Solomon; Catherine Hastings <i>Advisor:</i> Aleel Grennan, Ph.D.	Analyzing Survey Data: Using Classification Results for Better Data Understanding Anxhela Sejdi <i>Advisor:</i> Elena Braynova, Ph.D.	Water Quality Along the Tatnuck Brook Cailey A. Ryan; Alyssa Hammond; Klarissa Johnson; Austin Salvatore <i>Advisor:</i> Laura Reynolds, Ph.D.
9:30-10:20	Foster Room	Reparations for the Vietnam War Nicholas M. Nassar <i>Advisor:</i> Henry C. Theriault, Ph.D.	Reparations for the Nanjing Massacre Abigail Peters <i>Advisor:</i> Henry C. Theriault, Ph.D.	Conflict on the Israeli-Gaza Strip Border Erin Rose Condon <i>Advisor:</i> Henry C. Theriault, Ph.D.
	Fallon Room	The Origin and Legacies of the Prison-Industrial Complex Jeremy D. Lutton <i>Advisor:</i> Tona, Hangen, Ph.D.	Banning of Books in Public Schools in the United States Anjelica M. Burgess <i>Advisor:</i> Nafisa Nipun Tanjeem, Ph.D.	Latinx Representation in the Engineering Profession: A Study of Structural Barriers and Pathways to Success Alamna De La Cruz <i>Advisor:</i> Nafisa Nipun Tanjeem, Ph.D.
10:30-11:20	Foster Room	Bosnian Genocide Redress and Reparations Daniel C. Parker <i>Advisor:</i> Henry C. Theriault, Ph.D.	Reparations for Belgium's Actions in the Congo Joanna B. Presume <i>Advisor:</i> Henry C. Theriault, Ph.D.	Reparations for East Timor Thomas Flaherty <i>Advisor:</i> Henry C. Theriault, Ph.D.
	Fallon Room	Enhancing Mental Health and Stress Management for Preschool Daycare Staff in Massachusetts: A Collaborative Intervention Katelyn I. Bindas <i>Advisor:</i> Kevin Kane, MPA	Murder Houses to Haunted Houses: Monetizing (Dis)belief in the Paranormal Savannah Stowe <i>Advisor:</i> Alex Briesacher, Ph.D.	#Hopecore vs. Gen-Z Rachelle M. Blais <i>Advisor:</i> Lagnajita Chatterjee, Ph.D.
11:30-12:20	Foster Room	Reparations for the "Comfort Women" System Carissa E. McKee <i>Advisor:</i> Henry C. Theriault, Ph.D.	The Armenian Genocide: Redefining of the Definition of Genocide to Help Prevent Violence Against Women and Girls Ryenne McGowan <i>Advisor:</i> Henry C. Theriault, Ph.D.	Reparations and the "Comfort Woman" System Lea Gaspar <i>Advisor:</i> Henry C. Theriault, Ph.D.
	Fallon Room	Development of a Data Sonification Tool to Transcend Standard Visualization Analyses Jacob Elbirt <i>Faculty Advisor:</i> Ali Al-Faris, Ph.D.	"Que Sera, Sera": An In-Depth Look into Inequality on the Haitian-Dominican Border A video presentation by Mariana Velez <i>Advisor:</i> Jennifer Hood-DeGrenier, Ph.D.	

CELEBRATION OF SCHOLARSHIP & CREATIVITY

Welcome to the seventeenth annual Worcester State University Celebration of Scholarship & Creativity. This is one of the highlights of the academic year at Worcester State University as we showcase the wonderful creative and scholarly work of our students.

We are enormously proud of the opportunities our undergraduate and graduate students have to embrace active learning locally, nationally, and internationally in concert with outstanding faculty mentors who are exceptional leaders in their fields. The day is filled with a variety of oral presentations, posters, exhibitions, and performances across disciplines of study from the natural sciences, allied health, arts, humanities, and social sciences.

Please immerse yourself today in this culture of active learning and savor the abstracts here as a window into what happens every day at Worcester State University.



Lois A. Wims, Ph.D.

Provost and Vice President for Academic Affairs

BIOLOGY

Understanding the Impact of Soil Nematodes on *Arabidopsis thaliana* Growth

Teresa Fitzgerald; Grace Adams

Faculty Advisor: Aleel Grennan, Ph.D.

Poster Presentation — Traditional

The presence of nematodes in the soil is beneficial, as they decompose organic matter and help to recycle nutrients for plant growth; however, a portion of soil nematodes are classified as parasitic to plants. Plant-parasitic nematodes inhibit the growth of their host by feeding on the roots with their stylet, which creates galls or root knots. This blocks the transport of water and nutrients through the plant, as well as providing an entry point for other plant pathogens. The *Arabidopsis thaliana* accessions growing in the presence of soil nematodes will have their growth inhibited, whereas these same accessions growing in the absence of soil nematodes will grow as usual.

Adaptive Responses of *Arabidopsis thaliana* to Contrasting Light Conditions

Rochelle Carolino; Beck Adjei-Nyame

Faculty Advisor: Aleel Grennan, Ph.D.

Poster Presentation — Traditional

Arabidopsis thaliana, a widely studied model plant species, is an ideal system for investigating plant responses to varying light conditions. In this study, we explored *Arabidopsis*'s physiological and molecular adaptations to high- and low-light environments. Light pollution, the excessive or misdirected artificial light produced by human activities, can have significant negative impacts on both plants and wildlife. To simulate high and low light conditions, *Arabidopsis* plants were subjected to controlled growth conditions under distinct light intensities. To quantify the growth and maturity of each plant, the levels of pigment displayed by it will be analyzed and assessed. One expects to see a less mature plant as a result of higher artificial light intensity and the opposite for a plant experiencing the opposite.

Is There a Change in Flowering Time of New England Wildflowers?

Alexis Doko; Mackenzie Vollmer; Anna Solomon; Catherine Hastings

Faculty Advisor: Aleel Grennan, Ph. D.

Oral presentation

Warmer winters and earlier springs have led to earlier flowering times for several different wildflowers throughout New England. We are investigating if flowering times have changed in *Viola sagittata*, *Robinia pseudoacacia*, *Cardamine diphylla*, and *Iris versicolor*. We are using online herbaria to find information regarding the flowering times of these plants in New England over the last 100 years. Prior research has found that due to increasing temperatures, flowers growing in similar environments have bloomed two to three weeks earlier than 100 years ago. Therefore, we expect that the current flowering times will be two to three weeks earlier than the flowering times of these plants 100 years ago.

A Speed-Accuracy Trade-Off Validation of Virtual Reality Simulations

Sarah M. Doyle; Adam N. Jacher

Faculty Advisor: Luis Rosado, Ph.D.

Poster Presentation — Traditional

Virtual reality (VR) presence is amplified when reality and a simulation are tightly coupled and enhance a player's immersion. [1] Immersion is the ability to be physically present in a simulated world. In order to validate the immersion of our VR replication of the physical lab space, we conducted a virtual target accuracy task. Fitts's Law states that the speed of a task is inversely related to target accuracy. Participants used a VR headset to touch a target bullseye as quickly and as accurately as possible. We found the speed-accuracy trade-off for medium- and large-sized targets but not for small targets. These results validate the immersion of our VR simulation from a medium to large scale only.

Investigating the Use of Restriction Fragment Length Polymorphisms (RFLPs) to Determine the Distribution of Invasive Cattail Species in Worcester

Disha Khanna

Faculty Advisor: Aleel Grennan, Ph.D.

Poster Presentation — Traditional

Cattails can reduce pollutants and contaminants from soil or water through the process of bioremediation. *Typha latifolia* is a native cattail commonly found in wetlands across the United States. Another cattail species, *Typha angustifolia*, an aggressive invasive, is thought to have been introduced from Europe. Ecological impacts of this invasion include reducing wetland species diversity and replacing native species from the wetlands. The objective of this study is to determine which species of cattail are present in Worcester. DNA from cattails was isolated and a conserved gene amplified. Restriction fragment length polymorphisms were then used to distinguish between the two species. This procedure will help us rapidly understand how widespread the invasive cattail species is in Worcester.

Exploring Growth Rates and Local Adaptations of *Arabidopsis thaliana* Through Soil

Rebecca Lyrio, Stephen Bruder, Elizabeth Stone

Faculty Advisor: Aleel Grennan, Ph. D.

Poster Presentation — Traditional

Through a common garden experiment, this study will assess the time of germination to maturity of *Arabidopsis thaliana* collected from six different countries: Turkey, Azerbaijan, Georgia, Italy, the United Kingdom, and the United States. Growth will be assessed under shared conditions in two different soil types: inoculated “super” soil and rocky, fast-draining soil. Plants reaching maturity faster in soil conditions similar to their seed origin would suggest localized adaptations. We predict plants with parents from rockier soil origins will mature faster on average. Phenotypic plasticity, the environmentally induced change in phenotype expression of organisms with the same genotype, may be demonstrated if plants reach maturity faster in one soil type. It is expected that most seeds planted in inoculated soil will reach maturity faster.

Phylogenetic Analysis of *Xenopus* NLRP Genes

Stephanie L Marcoux

Faculty Advisor: Daron Barnard, Ph.D.

Poster Presentation – Traditional

NLRP14 is one of the 14 pyrin domain-containing cytoplasmic receptors that belong to the NOD-like receptor family and is believed to have a part in human development. When examining the South African clawed frog (*Xenopus laevis*), a well-known vertebrate model in cell and developmental biology, it appears there are duplications on Xtrop and the laevis L chromosomes but not on the S. A tblast search is an algorithm that helps compare the primary biological sequences such as the amino-acid sequences of proteins or the nucleotides of DNA and RNA sequences. When a tblast search is done, there are multiple hits on chromosomes 8 and 8L. This paper aims to provide a better understanding of how to name these different hits on chromosomes 8 and 8L.

Effects of Varied Water Temperatures on the Growth of *Arabidopsis thaliana*

Andrew Stefanik; Zachary Trudell; Harley Westgate; Riley Whalen

Faculty Advisor: Aleel Grennan, Ph.D.

Poster Presentation — Traditional

Our research question addresses the effects of water temperature on *Arabidopsis thaliana* growth. Our experiment intends to examine this concept and quantify plant growth. Our experimental design encompasses warm (26°C), room (15°C), and cold (4°C) water temperatures across five *Arabidopsis thaliana* accessions from around the globe. All plants will be grown in the same controlled environmental conditions, with three plants from each accession, only altering water temperature. We expect that warmer water temperatures will allow for increased nutrient uptake, theoretically positively influencing rosette diameter and maturity rate. We do not anticipate that the regional origin of the accessions of *A. thaliana* will influence the effects of the different water temperatures being used as our experimental factor.

BIOLOGY AND CHEMISTRY

Investigating the Antimicrobial Efficacy of Imines: Implications for Microbial Control Strategies

Camarlin Franco; Eric Merriam; Rokaih Al Aloussi; Nooran Alaloosi

Faculty Advisors: Maura Collins, Ph.D.; Margaret Kerr, Ph.D.

Poster Presentation — Traditional

Imines, chemical compounds derived from ammonia, aldehydes, or ketones, have shown potential in modulating microbial growth. This review explores the impact of imines and other similar compounds on microorganisms, particularly their ability to inhibit growth. This study sheds light on their potential as antimicrobial agents. Investigating the interactions between these compounds and microbial targets offers opportunities to develop novel antimicrobial strategies. Overall, this research showcases the importance of these compounds in microbial control and highlights avenues for further exploration in the field of antimicrobial chemistry.

Antibacterial Agent Development Using Flavones Synthesized Via Greener Microwave Methodology

Kimberly Vo; Nazdana Darwishi; Olivia Latino

Faculty Advisors: Margaret Kerr, Ph.D.; Maura Collins, Ph.D.

Poster Presentation — Traditional

Antibiotic resistance kills 35,000 people in the U.S. each year. There is a need for the development of new classes of antibacterial agents. Flavones are a class of natural products that occur in plants and are known to have antibacterial properties. These can be synthesized in high yield using microwave irradiation. Microwave synthesis is considered to be an effective and environmentally friendly system. In order to create a library of complexes to study, various flavones have been synthesized with differences in functional groups and size. These complexes have been evaluated against various bacteria and have demonstrated antibacterial activity. Bacteria tested include *Staphylococcus aureus* (gram positive) and *Escherichia coli* (gram negative).

BIOTECHNOLOGY

Effect of IFIH1 on the Early Development of *Xenopus laevis* Oocytes

Quinn Bradley

Faculty Advisor: Daron C. Barnard, Ph.D.

Graduate Project

Poster Presentation — Traditional

There are many interacting proteins and chemical signal cascades that are involved in the complex process of an organism's early development. A key component of this process is the activation of maternally inherited mRNAs that lay dormant until a cellular signal initiates their translation into a functional protein. The protein MDA5 that is encoded by the gene IFIH1 is known to distinguish between native and viral RNAs based on chemical markers associated with the RNAs, such as poly-A tails and cap methylation. Activity of IFIH1 is regulated by the protein DHX29. Using the African clawed frog, IFIH1 and DHX29 mRNA are extracted from the oocyte so that they can be overexpressed and their impact on egg maturation can be observed.

The Steppke Gene and Insulin Pathway in *Drosophila*

Corey Clark; Daniel Navas; Colin Fitzgerald

Faculty Advisor: Daron Barnard, Ph.D.

Poster Presentation — Electronic

Drosophila is a model organism for DNA and gene study due to its malleable DNA and ability to reproduce rapidly. Having many orthologous genes with humans, its genome has been extensively researched. The Steppke gene plays a crucial role in the development of *Drosophila*, functioning as a positive regulator in the insulin signaling pathway. Annotation of the Steppke gene and cross-species examination allow analysis of pathway evolution. Following the lineage of species such as *D. subobscura*, *D. guanche*, and *D. novamexicana* with different climate and geological preferences enables us to see how the gene has evolved within its designated species.

Conservation of the Tor Gene Between Different Species of Drosophila

Mirok R. German; Brendan P. Ronan; Aidan J. Desilets

Faculty Advisor: Daron Barnard, Ph.D.

Poster Presentation — Traditional

We used genetic information from NCBI and Flybase relevant to the target of rapamycin (tor) gene in three species of *Drosophila* (albomicans, guanche, and miranda). The tor gene acts toward the end of the insulin receptor signaling pathway, found in *Homo sapiens*, *Drosophila*, and many other organisms. Dysregulation of the tor gene is linked to overgrowth of organisms, and tor complex 1 and 2 (torC1/2) is also deeply involved in protein synthesis and regulation of the actin cytoskeleton, respectively. We examine the conservation of the tor gene in *Drosophila* to determine the importance of the gene within the insulin signaling pathway.

A Cross-Species Comparison and Annotation of the Supernumerary Limbs Gene in Drosophila

Stephen E. Humphrey; Madison Duquette; Ryan E. Trenholm

Faculty Advisor: Daron Barnard, Ph.D.

Poster Presentation — Electronic

Using bioinformatics, genes can be analyzed to create a better understanding of the evolution and function of biological pathways. *Drosophila* are commonly used for studying genes homologous to humans. The focus of this study is to detect whether genes in the insulin signaling pathway are evolutionarily conserved with a cross-species comparison between three *Drosophila* species; *D. miranda*, *D. hydei*, and *D. obscura*. Through the annotation of the “supernumerary limbs” (slmb) gene, a component of a macromolecular ligase complex, its importance in the negative regulation of the insulin receptor pathway can be better understood. This study will contribute to a long-term multi-institutional project led by the GEP to understand the evolution and function of biological pathways.

Effect of mTwist1 Phosphorylation Site Mutants on the Epithelial-Mesenchymal Transition Associate with Cancer Metastasis

AnnaKate Kinnear, Aspen Zheng, Jibril Haq

Faculty Advisor: Jennifer Hood-DeGrenier, Ph.D.*Funding Source:* Worcester State Foundation Student Research, Scholarship, and Creative Activity Grant

Commonwealth Honors Project

Poster presentation — Traditional

Metastasis is the process of cancer cells dissociating from a primary tumor and reseeding new growths in distant tissues, during which cells undergo distinct phenotypic changes known as the epithelial-mesenchymal transition (EMT). The EMT is driven by abnormal expression of specific transcription factors, including Twist. We hypothesize, regarding the Serine-144 and 148 phosphorylatable sites of Twist, that site-directed changes to the amino acid sequence could affect the functionality of Twist in inducing the EMT. Analysis will be performed by altering the amino acid sequence to substitute non-phosphorylatable and phosphorylation-mimicking residues. Plasmids will be generated to express the above-mentioned Twist mutants fused to GFP; these will be transfected into MDCK cells, and activity assays will be performed utilizing fluorescent microscopy and western blotting.

BUSINESS ADMINISTRATION AND ECONOMICS**#Hopecore vs. Gen-Z**

Rachelle M. Blais

Faculty Advisor: Lagnajita Chatterjee, Ph.D.

Oral Presentation

This project treats the trend of “#hopecore” motivational videos found mainly on the platform TikTok. The goal is to determine if there is a long-term effect on Gen-Z mental health after viewing these videos of positivity. This trend highlights celebrities and everyday people celebrating important moments in their lives that show others the positive side of life. Through informal anecdotal discussions, college-age individuals reported that they considered these videos to be “heartwarming.” Through these videos, they have found more time within their days to be nice without realizing it. This study will showcase my findings regarding the positive long-term connection on Gen-Z and how these videos work to trigger emotions.

Modeling Risk in Commercial Banking: The Influence of the Macroeconomy on Regional Bank Performance

Collin P. Heenan

Faculty Advisor: Abir A. Bukhatwa, Ph.D.

Poster Presentation — Traditional

This project examines the relationship between macroeconomic variables and regional bank performance, focusing on liquidity, credit, and market indicators. The objective is to provide a nuanced understanding of how broader economic conditions influence the operational dynamics of regional banking institutions. Utilizing a comprehensive data set composed of key metrics from U.S. commercial banks not ranked in the top 100 in the United States as well as multiple statistical methods, this model examines the interplay between macroeconomic factors, such as gross domestic product (GDP) growth, the Consumer Price Index (CPI), unemployment rates, and interest rates, and key bank performance metrics, including net interest income, total deposits, and delinquency rates.

BUSINESS ADMINISTRATION/ECONOMICS AND PSYCHOLOGY

How Memory is Influenced by Different Online Interactions

Kayla M. O’Leary; Cara C. Prunier

Faculty Advisors: Brittany M. Jeye, Ph.D.; Lagnajita Chatterjee, Ph.D.

Poster Presentation — Traditional

Building on prior work examining how taking and editing photos can shape memory, this project investigates whether the ways in which people interact with photos (such as on social media) influence what they remember. Across three experiments, participants were shown a series of photos and asked to select an emoji, provide a hashtag, or provide a comment/retype the photo title (i.e., the control) for each photo shown. Participants’ memories for the photos were tested using an old-new recognition paradigm. If participants remembered seeing the images, follow-up questions about the photo details and interactions were asked. Analyses will look at the relationships between whether participants can correctly identify previously seen photos, how they interacted with the photos, and whether they remembered their responses to the photos.

CHEMISTRY

Trace Metals in the Tatnuck Brook Watershed

Kwaku A. Bonsu, Adam Shenk

Faculty Advisor: Meghna Dilip, Ph.D.

Poster Presentation — Traditional

Soil, sediment, and various plant samples were gathered at several sites within the Tatnuck Brook watershed. Qualitative and quantitative analysis of metals was conducted using inductively coupled plasma (ICP) optical emission spectroscopy. The results are related to urbanization, changes in land use, and other pertinent environmental factors.

Testing Experiments’ Practicality for Upper-Level Chemistry Courses

Klarissa Johnson

Faculty Advisor: Kathleen Murphy, Ph.D.

Poster Presentation — Traditional

There is always an opportunity to modify a laboratory procedure to enhance the learning experience of students. In addition, incorporating demonstrations into the classroom is a very effective teaching tool. But before a laboratory procedure or demonstration can be incorporated into the curriculum, it must be designed, tested, and adapted to fit within the time of a laboratory period. This poster describes the development of several laboratory procedures and demonstrations that will soon be adopted into two upper-level chemistry courses. All of them include the use of laboratory instrumentation, including inductively coupled plasma optical emission spectroscopy (ICP-OES), gas chromatography (GC), and liquid chromatography (LC).

Synthesis and Catalytic Studies of Mono- and Bi-Dentate Imine and Amine Complexes

Rebecca Lovejoy; Jeremy Bullock; Lauren Underdown

Faculty Advisor: Jeremy R. Andreatta, Ph.D.

Poster Presentation — Traditional

A series of imine and amine compounds have been synthesized via various methods, including microwave radiation, to improve the overall greenness of the reactions. Transition metal complexes of the synthesized ligands were then tested as potential catalysts for the oxidation of cyclohexane to cyclohexanone, which is a commodity chemical used in the production of nylon polymers.

Synthesis and Catalytic Studies of Bis-iminopyridine and Bis-aminopyridine Complexes

Hunter Novak; Aiden Fish

Faculty Advisor: Jeremy R. Andreatta, Ph.D.

Poster Presentation – Traditional

Several bis-iminopyridine and bis-aminopyridine ligands have been synthesized and characterized. Their transition metal complexes have been investigated as potential catalysts for the oxidation of cyclohexane to cyclohexanone, which is a commodity chemical used in the production of nylon polymers.

COMMUNICATION SCIENCES AND DISORDERS**Changes in Cognitive Performance After Treating Hearing Loss for One Year**

Samantha R. Kelleher; Theresa T. Nissenbaum; Anna M. Rideout

Faculty Advisor: Keith N. Darrow, Ph.D.

Poster Presentation — Traditional

In the past decade, hearing health care focused on the impact of hearing loss on cognitive performance. A series of research reports indicated that hearing loss may significantly increase the risk of cognitive decline and dementia. Since then, the treatment of hearing loss has been suggested to be the most modifiable factor for preventing dementia. The goal of this study was to understand the impact of treating hearing loss on several cognitive domains after 60 days and one year after starting treatment. Adult participants including both new and current hearing aid users undergo a cognitive screening pre- and post-treatment (60 days and one year after starting treatment with hearing aids). Differences across modalities are being compared to observe differences in cognitive abilities that may result from treating hearing loss.

Rhode Island Deaf/Hard of Hearing Project

Meaghan Marcoux

Faculty Advisor: Kym Meyer, Ph.D.

Commonwealth Honors Project

Poster Presentation — Traditional

The research aimed to discover the state of educational audiology in Rhode Island. Prior research indicated that there is a growing number of deaf and hard-of-hearing students not being served by educational audiologists in public schools. In 2016, there were 1,273 full-time audiologists recorded in public schools in the United States (Johnson & Seaton, 2021). A survey sent to Rhode Island special education directors attempted to identify the state of educational audiology offered in Rhode Island public schools. The data addresses the following research questions: who are the service providers for deaf and hard-of-hearing students in Rhode Island public schools, and what do Rhode Island special education directors know about educational audiologists.

Competing Cues in Preschooler Verb Learning

Hannah L. Picchioni; Jenna M. Winiker; Kiara M. Hourigan

Faculty Advisor: Samantha L. Scripture, Ph.D.

Commonwealth Honors Project

Poster Presentation — Electronic

Children use a variety of cues during their first encounters with unfamiliar words to figure out their meaning. The cues children use for learning nouns are not the same as the ones for learning verbs. This research looked at how two sentence-structure-based cues could help preschool children determine the meaning of an unfamiliar verb. Differences were found between older and younger preschool children. These differences could have been the result of other types of competing cues in the sentence (e.g., number of subjects) and in the visual scenes. The researchers analyzed these other competing cues and the children's errors to better understand the discrepancy in performance between the group of preschoolers.

COMPUTER SCIENCE

IMDb's Top 1000 Movies in MySQL and Java

Cameron S. Baron

Faculty Advisor: Nada Alsallami, Ph.D.

Poster Presentation — Traditional

In many households, it is common to find people rewatching familiar movies. Primarily, the root of this issue is that they have not received recommendations for new movies to watch. This project addresses this issue by using MySQL to create a relational database management system from IMDb's Top 1000 Movies data set and enabling users of any expertise level to access the information within the data through an intuitive Java program. The user has multiple options, including searching and categorizing, adding favorites, getting movie recommendations, and even performing simple statistical analysis. Future directions include implementing a graphical user interface for improved user experience and integrating additional movie data and machine learning components to provide custom results to users.

2022 World Cup

William Cordor

Faculty Advisor: Nada Alsallami, Ph.D.

Poster Presentation — Electronic

This project developed a program to display accurate statistical information from the 2022 World Cup so as to be able to search easily for information related to specific, individual goals scored. The database was created using MySQL workbench to save data related to entities "country", "goalscorer", and "goal". Relationships were successfully inserted to make the process of retrieving, filtering, and slicing the data more accurate and flexible. SQL language is used to retrieve interesting information from this data such as specific matches and top scorers for specific countries. An interface was created to access this database using Java language. Future directions would include creating a wider database including every World Cup and implementing Java Scanner class.

Enhanced Inventory Management System for a Retail Company

Maria Delia

Faculty Advisor: Nada Alsallami, Ph.D.

Poster Presentation — Electronic

The project aims to address the data management challenges encountered by a retail company by implementing a comprehensive relational database solution using MySQL platform. Leveraging a data set sourced from Kaggle, the project entails the creation of tables to organize and store different data types and establishes essential relationships between tables. Through the execution of various SQL queries, the project seeks to analyze sales data, customer behavior, and product trends effectively. The outcome includes the successful setup of the database, creation of structured tables, and execution of insightful data analyses within a retail context.

An Exploration into Eurasian Flight Prices and Key Influencers

Jacob Elbirt

Faculty Advisor: Elena Braynova, Ph.D.

Poster Presentation – Traditional

This project provides an analysis of an online flight information dataset focused on Eurasian flights sourced from Kaggle.com. The dataset contains 300,153 complete instances, each featuring 3 numerical and 7 nominal attributes such as price, flight duration, number of days between booking and flight, source and destination cities, and more. A wide variety of visualization, statistical analyses, and machine learning methods were applied to explore this dataset including correlation matrices, regression analyses, Apriori Association Rules analyses, and more. R packages were used for visualization and statistical analysis parts and the Data Mining tool WEKA for machine learning tasks. Some intriguing dependencies and trends were discovered.

Development of a Data Sonification Tool to Transcend Standard Visualization Analyses

Jacob Elbirt

Faculty Advisor: Ali Al-Faris, Ph.D.

Funding Source: WSU Aisiku STEM Center Grant

Oral Presentation

Data manipulation and analysis are critical for companies, researchers, and universities to identify trends and extract additional information from numerical data. Normalization and logarithmic transformations are commonly used to improve data readability in representations. Spreadsheet applications like Microsoft Excel and Google Sheets provide tools for these tasks but quickly become cumbersome and time consuming, requiring considerable experience with spreadsheet applications, data formatting, and chart generation. While various visual representations are common in spreadsheet applications, audio analysis/representation are largely untapped resources. This work presents an approach to sonifying numerical data sets in spreadsheet format by representing the data as audio played during chart generation. The approach involves developing software in Java and provides a unique opportunity to express data sets and trends to individuals who are visually impaired.

Grocery Store Management System

Andrew George; Drew Eid

Faculty Advisor: Nada Alsallami, Ph.D.

Poster Presentation — Electronic

We developed a system that seeks to optimize grocery store operations and present information on all departments in an organized manner. This system can be broken down into two major components: the database and the Java program to access the data. Our database, coded in SQL, stores information regarding suppliers, inventory, employees, and more. This database is accessible to update and has an organized format that links all elements together. Our Java program pulls information from the database, specifically inventory data, and can create orders based on the imported objects. These two components allow the user to manage internal and external operations from the same software. This results in a more centralized workflow, which will increase store efficacy.

Medical Care Application Development Through Android Studio

Jason Lee

Faculty Advisor: Nada Alsallami, Ph.D.

Funding Source: WSU Summer Undergraduate Research Grant
Poster Presentation — Electronic

This study focuses on the development of a user-centric medical care application using Java in Android Studio, aiming to empower patients and streamline interactions with health care providers. The application features essential pages such as appointments, emergency contacts, health goals, and sensor-driven monitoring of heart rate, light exposure, step count, and temperature. Results indicate successful data collection, including real-time heart rate display, light exposure warnings, and step count tracking utilizing accelerometer and gyroscope sensors, as well as collection of user feedback. The application marks a significant stride in user empowerment, offering a convenient means for individuals to monitor their health. Future iterations may explore additional sensors for comprehensive health insights.

Fitness Tracker

Aaron Nano; Elio Ngjelo

Faculty Advisor: Ali Al-Faris, Ph.D.

Poster Presentation — Traditional

The fitness tracker project focuses on the development of an all-in-one app designed for any fitness goals, with an emphasis on powerlifting. It simplifies tracking important information by seamlessly logging into your account and entering different information such as calorie intake, body weight, etc. The app also offers personalized workout routines based on your goals, by giving you feedback such as the Wilks score and BMI. The user information is easily accessible and manageable; you are not only able to track but also edit the information. The app supports users in achieving their fitness goals effectively and efficiently.

Maze Game

Elio Ngjelo

Faculty Advisor: Ali Al-Faris, Ph.D.

Commonwealth Honors Project

Poster Presentation — Traditional

I developed a maze-solving game using a graph-based approach. The maze is represented as a weighted undirected graph. The program tells the user to navigate from a starting point to a destination through the shortest path possible. The graph is implemented using a custom class that utilizes Dijkstra's algorithm to find the shortest path. The maze layout is displayed graphically to the user, with vertices representing locations and edges indicating distances, which are randomly generated to make each game feel like a new one. The user then has to give a starting and destination point and then provide a guessed path through the maze. The program calculates all the user's input, compares it with its own answers, and then provides feedback.

Analyzing Survey Data: Using Classification Results for Better Data Understanding

Anxhela Sejdi

Faculty Advisor: Elena Braynova, Ph.D.

Funding Source: WSU Summer Undergraduate Research Grant

Oral Presentation

This research, conducted under Worcester State University's STEM summer program, focused on analyzing youth risk behavior survey data for New England states, spanning 1991-2019. The project entailed cleaning and preprocessing an extensive data set, followed by an in-depth analysis using visualization, statistical, and machine learning methods. Different variations were explored in risk behaviors across race and age groups, employing various classification techniques to uncover patterns, even with models of lower accuracy. This project demonstrates the analysis of survey data in interdisciplinary undergraduate research and can serve as a practical educational tool, enriching critical thinking and problem-solving skills for students in health, sociology, criminal justice, and computer science.

EARTH, ENVIRONMENT, AND PHYSICS

Analysis of Simulated Growth of Breast Cancer Cells

Aidan Desilets; Ioanna Tchangova

Faculty Advisor: Maxim Lavrentovich, Ph.D.

Poster Presentation — Traditional

We, in collaboration with Leipzig University in Germany, are analyzing the growth patterns of cancer cells through the extracellular matrix (ECM) in human breast tissue by combining modelling, computer simulations, and medical image analysis. The ECM is composed of numerous fibers, each with a certain orientation that influences cancer growth. These orientations are extracted from the medical images. We then create a three-dimensional lattice model of stochastic cell growth through the ECM in C++. We analyze the simulation data using Python and compare our results to observed cancer growth patterns. Our model will help us understand how the ECM affects breast cancer growth, which may have implications for cancer diagnosis and treatment.

Developing Algorithms to Reduce Human Bias in the Selection of Physical Parameter of Astrochemical Models Through Algorithms

Zachary M. Stomski; Brayden Wilcomb

Faculty Advisor: Andrew Burkhart, Ph.D.

Poster Presentation – Traditional

In astrochemical modeling, there is difficulty in determining the optical physical conditions for simulating molecules. In this project, I created an algorithm that will find the best fit parameters for astrochemical kinetic simulations with the three-phase NAUTILUS code to reproduce interstellar molecular abundances from the GOTHAM (GBT Observations of TMC-1: Hunting for Aromatic Molecules) survey. This work can help reduce human bias and increase comparability between chemical models in publications.

ARKHAM: How Ubiquitous Are Aromatic Molecules in Star-forming Regions?

Brayden Wilcomb

Faculty Advisor: Andrew Burkhardt, Ph.D.

Commonwealth Honors Project

Poster Presentation — Traditional

Aromatic molecules are a vital component of biochemistry, and their origin is of great importance to understanding the origins of life. To investigate their origin, I analyzed data collected by the observational survey ARKHAM (A Rigorous K/Ka-Band Hunt for Aromatic Molecules) using the Green Bank Telescope. I used this data to determine the formation of simple aromatic molecules, such as benzonitrile, in star-forming regions. I analyzed spectra from star-forming regions within the Serpens cloud and the Taurus molecular cloud and detected for the first time benzonitrile within Serpens 3a, 4a, and 4b. I compared the abundance of benzonitrile in these sources to HC7N and HC9N, common carbon chain molecules that may be involved in the formation of aromatic molecules in the interstellar medium.

EDUCATION

Parental Influence on Their Child's Career Choice

Lani Corbett; Aaron Peaslee; Nathalie Abingabiye; Kristine A. Camacho, Ph.D.

Faculty Advisor: Kristine Camacho, Ph.D.

Graduate Project

Poster Presentation — Traditional

This study investigated parental influence on their children's life that reflects on how satisfied the child will be when picking their future career. Surveys were administered to Worcester State University undergraduate students. The results indicated that when parents put more pressure on the child, their quality of relationship with satisfaction decreased. When there is more pressure on picking a career from the parents, the quality of the child's satisfaction with their career choice decreases. Parental pressure impacts satisfaction with current career choice.

Mapping School-Based Mental Health Resources Using GIS

Abigail Doyle

Faculty Advisor: Kristine A. Camacho, Ph.D.

Graduate Project

Poster Presentation — Traditional

This presentation will focus on efforts to research and map state mental health resources for school psychologists and school counselors across the state of Massachusetts. Using data that is available from the Massachusetts Department of Education and GIS software, this session will compare resources found in various districts throughout the state to the recommended ratios advocated for by the National Association of School Psychologists and the American School Counselors Association. Implications for advocacy and social justice will be discussed.

Rethinking School Psychologist Ratios Through a Practice Model Lens

Christina Dwyer

Faculty Advisor: Kristine A. Camacho, Ph.D.

Graduate Project

Poster Presentation — Traditional

National conversation has focused on the importance of maintaining a 1:500 school psychologist to student ratio when school psychologists are practicing within the comprehensive role (National Association of School Psychologists [NASP], 2020b). Existing research fails to capture the variation in school psychologist practice and that many school psychologists often wear multiple hats, such as IEP team chairs or 504 coordinators. Using a time-tracking procedure, 84 school psychologists from 60 school districts recorded their daily activities over a two-week period. The percent of time school psychologists were engaged in NASP Practice Model versus non-Practice model activities was calculated to reconceptualize how the ratios are viewed. The ratios were different in about half of participant districts when reconceptualized according to the NASP practice model.

Promoting School Safety: Educator Perceptions on the Effectiveness of School Safety Strategies

Mikayla Halloran; Christina Dwyer; Jessilyn Smith

Faculty Advisor: Kristine A. Camacho, Ph.D.

Graduate Project

Poster Presentation — Traditional

The current study examined and aimed to understand how educators perceive safety protocols in their school. The researchers surveyed education staff at New York State public schools about their perceptions of building safety protocols and their impact on overall sense of safety at school. Moderate positive correlations were found between both staff understanding of their school's crisis plans and threat assessment policies and their perceptions of feeling safe. Strong positive correlations were found between staff confidence in their school's ability to implement both their crisis plans and threat assessment policies effectively and their perceptions of feeling safe. Implications for practice are discussed.

College Student Anxiety During Remote Learning

Madelyn Moorhouse, Emerson Chapski, Thais Barbosa Vigilato Ribeiro

Faculty Advisor: Kristine A. Camacho, Ph.D.

Graduate Project

Poster Presentation — Traditional

The current study aimed to understand how remote learning had an effect on students' levels of anxiety. The researchers surveyed undergraduate students about their experiences with remote learning during the pandemic to gain an understanding into any effect on their levels of anxiety. A positive correlation was found between remote learning and students' anxiety levels. Implications for practice will be discussed.

Work-Life Balance and Mental Health in Undergraduate Students

Jessica L. Palermo; Carter I. Freedlander; Angelica M. Torres; Sonya L. Cabral

Faculty Advisor: Kristine A. Camacho, Ph.D.

Graduate Project

Poster Presentation — Traditional

This study examined how work-life balance and mental health impact undergraduate well-being. The investigators administered surveys and performed statistical analysis to identify how undergraduate students perceive their overall well-being, and to clarify the relationships between work-life balance, mental health, and student well-being. The investigators also sought to understand if employment, residency status, and/or other personal factors significantly impact work-life balance and mental health for undergraduate students. Results indicate that undergraduates were least satisfied with their mental health, followed by social life and work-life balance. Universities should be prepared to support undergraduate students experiencing symptoms of depression and anxiety and should provide support for undergraduates aimed at early intervention to decrease the likelihood of experiencing multiple symptoms of depression or anxiety.

University Policy Support for Threat Assessment: A Case Analysis of Public Higher Education Institutions in One U.S. State

Jill Petkewich; Christina Dwyer

Faculty Advisors: Kristine A. Camacho, Ph.D.; Christina Kaniu, Ph.D.

Poster Presentation — Traditional

Threat assessment policies of all public, four-year, higher education institutions in one U.S. state were examined. Only five of the 11 institutions had clear threat assessment policies in place. Those institutions that did have policies in place often did not include all of the best practice recommendations for effective threat assessment policies as indicated in the threat assessment literature. As university counseling staff are often in the position of playing a critical role on university-based threat assessment teams, the implications that this has for policy and practice will be discussed.

Building Capacity for Underserved Districts Through Graduate Education

Angelica M. Torres

Faculty Advisor: Kristine A. Camacho, Ph.D.

Graduate Project

Poster Presentation — Traditional

School psychologists (n=324) were surveyed in one state within the northeast United States to identify factors that could influence their decision to accept employment in underserved districts and strategies that graduate educators could use to encourage graduate students to accept employment in underserved districts after graduation. Results indicate that pay and benefits, combined with the role that the school psychologist has within the district, are critical factors when determining place of employment. Other factors that influence employment decisions include ability to maintain a work-life balance, access to adequate resources, positive school climate, and belief that one could make a difference in a school system. Respondents indicated that graduate programs could support students in taking positions in underserved districts by addressing these core issues.

The Effects of a Gap Year on a Student's Mental Health

Rebekah Walker; Carolyne Gilligan; Kimberly Mann

Faculty Advisor: Kristine A. Camacho, Ph.D.

Graduate Project Poster Presentation — Traditional

The current study aimed to understand the effects that taking a gap year can have on the mental health of a college student. The researchers surveyed undergraduate and graduate students regarding their gap year experience, or lack thereof, their opinion on whether a gap year impacted their mental health, and their experience with symptoms of anxiety, depression, and burnout. Descriptive statistics were run to analyze and interpret participants' demographics. Independent samples t-tests examined also run to look at effects of a gap year on students' mental health. There was no effect of a gap year on a student's mental health. Implications for practice will be discussed.

College Student's Perceptions of Their Unhealthy Habits

Anne Marie Wall; Julia A. Richards; Madison D. Cole

Faculty Advisor: Kristine A. Camacho, Ph.D.

Graduate Project

Poster Presentation — Traditional

This study examined student perceptions of habits that may influence their academic performance and emotional well-being. Undergraduate students at one public university in the northeastern United States were asked to complete a survey that focused on their healthy and unhealthy behaviors and how these behaviors influenced their academic achievement and emotional well-being. Results indicated that students did not report a significant correlation between their alcohol consumption and GPA ($R=-0.143$, ns). Close to 70 percent of the sample reported that they do not think drinking affects their grades. Additionally, 46 percent of individuals reported that alcohol use does not affect their emotional well-being. The implications of these perceptions of undergraduate students are discussed.

Exploring the College Experience of Students with Disabilities

Aliya Zubi; Madison Price

Faculty Advisor: Kristine A. Camacho, Ph.D.

Graduate Project

Poster Presentation — Traditional

This study used a quantitative survey design to compare how students with disabilities and students without disabilities rate their college experience. Undergraduate students completed a survey that asked questions about their academic performance, which activities they participate in on campus, and whether they feel included on campus. For academic performance, it was found that students with disabilities rated their academic performance lower than students without disabilities. Students with disabilities participated in activities on campus at a higher frequency than students without disabilities. There was no difference between groups in regard to feelings of inclusion on campus.

ENVIRONMENTAL SCIENCE

Sedimentary Record of Maine 1947 Wildfire

Kailey M. Adeyinka

Faculty Advisor: Laura Reynolds, Ph.D.

Poster Presentation — Traditional

Maine experienced its worst wildfires in 1947. These fires raged through forests and towns, in part because there was little equipment to handle wildfires at the time. Wildfires produce charcoal, which settles in lakes and wetlands near the fires; however, few sedimentary records of the 1947 fires exist outside of Acadia National Park. In this project, I sampled a sedimentary core sample taken from Biddeford, Maine, for sedimentary charcoal, carbon, and grain size analyses. The goal of this study was to determine if these sediments preserved evidence of the 1947 wildfires, and improve our understanding of how sediment preserves fire history. Preliminary results suggest two peaks in charcoal representing two fire events in the last ~100 years; future work will aim to date these events.

Impact of Acid Rain on Growth of *Brassica rapa*

Umutoni Helene

Faculty Advisor: Aleel K. Grennan, Ph.D

Poster Presentation — Traditional

Acid rain is due to chemical pollutants (SO₂ and NO_x) emitted in the air as a result of anthropogenic activities (primarily coal combustion) and natural events (such as eruption of volcanoes). Acid rain has a detrimental effect on plants, trees, and soils primarily due to the leaching of nutrients such as potassium, magnesium, and calcium from the soil as well as changes in soil pH. This can lead to slowed growth, damage to leaves and stomata cells, and death of plants. *Brassica rapa*, cv Wisconsin Fast Plants, are rapidly flowering plants that are cultivated indoors. *Brassica rapa* will be used to examine how acid rain affects its growth. Plants will be watered with both tap water and acidified water, and changes in growth parameters will be measured.

Fishing for Data: How Ice-fishing Can Improve Our Understanding of Lakes

Stephen E. Humphrey

Faculty Advisor: Laura Reynolds, Ph.D.

Funding Source: The Aisiku Foundation

Poster Presentation — Traditional

Freshwater lakes have been susceptible to recent Earth system changes; for example, northern lakes have recently experienced shorter seasons of ice cover. However, how lake ice thickness has varied over time is less well understood. Retrieving lake ice thickness data conventionally is expensive and time-consuming; therefore, the limited existing data is typically restricted to large lakes. This project explores how to use ice thickness measurements found in online ice fishing discussion boards to produce cost-effective data. Our preliminary results show clear regional differences in ice thickness histories of lakes throughout Massachusetts, which highlights the useability of this data. These data are without the cost and spatial restrictions described in other studies and provide insights into the mechanisms of ice formation in lakes.

Water Quality Along an Urban Gradient

Klarissa L. Johnson

Faculty Advisor: Laura Reynolds, Ph.D.

Funding Source: WSU Aisiku Individual Summer Grant

Poster Presentation — Traditional

My project compares water quality across four stream sites, which vary from very urban to more rural environments. We used hand-held water quality probes to collect turbidity, temperature, dissolved oxygen, and conductivity at each site from spring of 2022 to fall 2023. Following data collection, I organized and analyzed the data to determine trends over time and variations among sites. Data were examined for correlations and potential explanations were developed.

Literature Synthesis on the Connections Between Depression and Green Space in Cities

Paul Martino

Faculty Advisor: Laura Reynolds, Ph.D.

Poster Presentation — Traditional

Depression is a major concern affecting many teens and young adults. Past research has shown a connection between the availability of green spaces and improved mental health; however, these types of green spaces studied and their effects on mental health varied. This study will aim to use a literature synthesis to explore the connection between the accessibility of green spaces in urban areas and the rate of depression in the area. It will compile data from literature taken from different regions and summarize the conclusions. It will then apply these results to the city of Boston to determine how land use is affecting the mental health of its residents.

Water Quality Along the Tatnuck Brook

Cailey A. Ryan; Alyssa Hammond; Klarissa Johnson; Austin Salvadore

Faculty Advisor: Laura Reynolds, Ph.D.

Funding Source: WSU Aisiku STEM Center Grant

Oral Presentation

This project continued the study of the effects of urbanization on water quality along the Tatnuck Brook. In summer 2023, data were collected from Patch Reservoir and its tributaries, and Cooks Pond and its tributaries. We used water quality probes and other tools to measure conductivity, dissolved oxygen, turbidity, depth, Secchi depth (water clarity), and temperature from eight sites. We also collected samples for total phosphorus and quality control, which we sent to an external lab for analysis. Based on the data collected, some water quality metrics decline as the watershed flows from more rural areas to urbanized areas. However, other metrics are not clearly linked to urbanization. Additional research is required to further discover what controls the water quality along the Tatnuck Brook.

Turbidity Data Within Worcester Bodies of Water

Mya D. Sanders

Faculty Advisor: Laura Reynolds, Ph.D.

Poster Presentation — Traditional

Worcester contains many lakes and ponds that provide important habitats to wildlife and recreational opportunities for humans. Worcester State students and faculty have collected water quality data on Patch Reservoir and Cooks Pond over many years. Water clarity is an important water quality metric that tells how clear or cloudy water is and is measured by Secchi disk depths and turbidity measurements. Here I will analyze this clarity data to determine how water clarity varies throughout reservoirs and through time, and what environmental and/or human factors influence this measurement. Understanding what is causing the clarity to change will help us understand if anything can be done to help the affected ecosystems.

Patch Reservoir Wildlife Survey

Katie A. Steeves

Faculty Advisor: Laura C. Reynolds, Ph.D.

Poster Presentation — Traditional

The purpose of this study is to survey residents and students to answer our overarching research question(s) of how frequently and in what seasons different wildlife (specifically vertebrates including mammals, birds, fish, reptiles, and amphibians) are found around Patch Reservoir. We will use the community data collected via survey and publicly available data from iNaturalist to create an educational and publicly accessible field guide containing all of the wildlife people may see around Patch Reservoir. We plan to learn more about the community composition in this area along with species frequencies and how our community-generated data compares to publicly available data on iNaturalist.

A Soil Macroinvertebrate Analysis at 30 Breeze Drive (Patch Reservoir)

Andrew P. Stefanik

Faculty Advisor: Anne Armstrong, Ph.D.

Funding Source: WSU Summer Undergraduate Research Grant

Poster Presentation — Traditional

Soil macroinvertebrates were collected and identified in order to analyze potential differences in populations caused by the planting of a pollinator garden. Insects were collected via methods of pitfall traps (a container dug to surface-level that is filled with isopropyl alcohol) and Burlese-Tullgren funnels (a soil sample set into a funnel with an incandescent lightbulb over it; a container of isopropyl alcohol is set under, where the insects crawl down to). They were then identified in order to create an index of what was found. Collections and identification ran from June 2023 - September 2023. Differences in populations of the lawn and of the pollinator garden are still in the process of data analyzation.

Carbon Sequestration in Two Massachusetts Forests: Long-Term Trends and Response to Disturbance

Harley Westgate

Faculty Advisor: Allison Dunn, Ph.D.

Poster Presentation — Traditional

Global climate change is driven by human emissions of CO₂ and other greenhouse gases. In this study, we investigate the role forests, the largest terrestrial carbon sink, play in the regional carbon cycle. This study began in 2008 with annual measurements of tree diameters in two forests in Petersham, Mass. Using this data, we calculated forest carbon sequestration between 2008 and 2023. We found that our control site, a former red pine plantation, lost carbon to the atmosphere (from 137 MgCha-1 in 2008 to 49 MgCha-1 in 2023), possibly due to invasive red pine scale. The other site, naturally regenerating since a 1990 harvest, increased carbon storage from 35 MgCha-1 in 2008 to 64 MgCha-1. Our results underscore the complex carbon dynamics in forested ecosystems.

Youth Involvement in Communities: Developments and Connections

Harley Westgate

Faculty Advisor: Anne Armstrong, Ph.D.

Funding Source: WSU Summer Undergraduate Research Grant

Poster Presentation — Electronic

Following WSU student work to develop a pollinator garden at Patch Reservoir as part of the Environmental Stewardship course (GE299) in spring 2023, we worked with Worcester Green Corps (WGC), a Worcester workforce and city beautification organization, to monitor and maintain the garden and to research the impacts of participating in garden-based community science. Our aim was to begin examining the relationships among the social-emotional outcomes of WGC youth's participation in a community effort. Specifically, we were investigating the relationships among place attachment, place satisfaction, and psychological empowerment. Our findings highlighted three primary outcomes, including: gaining team-oriented social skills; contributing to "guiding" and "being an example" for younger community members; and a mixed response to the state of and attachment to Worcester as a whole.

GEOSPATIAL INFORMATION SCIENCE

GIS Analysis of Deer-Vehicle Crashes in Massachusetts

Timothy O’Leary

Faculty Advisor: William Hansen Ph.D.

Poster Presentation — Traditional

Deer-vehicle crashes are a recurring issue in Massachusetts. In our study we look into incidences of crashes and analyze them to see which areas are at a higher risk. We will make use of Department of Transportation data of reported deer crashes across the state throughout multiple years. We will load them into ArcGIS and join them with road segments to find which areas have higher average incidents of crashes. We will also compare our findings with town data and local land use to identify land covers associated with higher crash risk. We aim to have this study be a guide to finding a solution to reduce the commonality of these incidents and bring about better protection for drivers and local fauna.

Mapping of Heavy Metal Pollution in Worcester via GIS

Timothy O’Leary

Faculty Advisor: Laura Reynolds, Ph.D.

Poster Presentation — Traditional

Heavy metal pollution is a major source of environmental degradation that can come from industrial sites, posing a major health risk to the population. Our study aims to geospatially represent the extent of industry-derived heavy metal pollution in the city of Worcester via ArcGIS mapping software. EPA data of current sites and brownfield sites contain info on contaminant releases and can be represented in ArcGIS. Areas of high contamination can be paired with neighborhood-level health risk data to see if there are connections between pollution and health outcomes for a neighborhood. Our goal is to develop a product that can be used by Worcester stakeholders, environmental workers, governmental officials, and residents to focus decontamination efforts.

HISTORY

The Origin and Legacies of the Prison-Industrial Complex

Jeremy D. Lutton

Faculty Advisor: Tona Hangen, Ph.D.

Oral presentation

Through analysis of primary and secondary sources, this research seeks to identify and explain the origin of the United States’ prison-industrial complex (PIC), an exploitative system that makes use of convict labor and influences the policies of both corporations and state and federal governments. The PIC has its origins in early 1800s Southern prisons, which made use of incarcerated people for labor projects. However, the system of convict labor would drastically change following the Civil War and the abolition of slavery, events which dramatically shifted the social, legal, and economic landscape of the South. Convict leasing and later forms of exploitative convict labor would effectively become a new type of slavery for African Americans, and would become, and remain, economically significant to many state governments.

LIBERAL STUDIES

Banning of Books in Public Schools in the United States

Anjelica M. Burgess

Faculty Advisor: Nafisa Nipun Tanjeem, Ph.D.

Oral Presentation

The United States – including Massachusetts – has seen an unprecedented spike in book banning in public schools (Globe 2024). Historical and contemporary evidence shows that banning books has detrimental effects on students’ educational experiences (First Book 2023). Drawing on open-ended interviews, this research examines how parents, teachers, and the young generation perceive and respond to book banning in public schools and the impact on broader learning of young students. It also investigates the value of developing parental and educational guidance for reading instead of banning books, which can allow children to engage complex topics in a safe environment and train them to grow up as well-informed and thoughtful adults with critical minds.

Latinx Representation in the Engineering Profession: A Study of Structural Barriers and Pathways to Success

Alamna De La Cruz

Faculty Advisor: Nafisa Nipun Tanjeem, Ph.D.

Oral Presentation

Latinx students must overcome cultural nuances, economic barriers, and social expectations. The existing literature reveals persistent disparities in educational access and limited support structures, both academically and professionally, contributing to the underrepresentation of Latinx individuals in the STEM field, especially engineering professions. According to the 2019 Women, Minorities, and Persons with Disabilities in Science and Engineering report from the National Science Foundation's National Center for Science and Engineering Statistics, only 15.5 percent of engineers are female and only 8.3 percent are Hispanic or Latinx. This project will provide practical recommendations for policymakers, educational institutions, and organizations regarding this issue. It will argue for a more inclusive, diverse, and supportive environment, where the Latinx population can thrive in engineering professions in Massachusetts.

Special Olympics Rhode Island's Unified Recognition Program

Allyson G. Graves

Faculty Advisor: Aldo V. García-Guevara, Ph.D.

Poster Presentation — Electronic

The Unified Champion Schools (UCS), funded by the United States Department of Education, focuses on “implementing inclusive sports, inclusive youth leadership opportunities, and whole school engagement” in schools (Special Olympics Unified Champion Schools®, 2018). The UCS initiative promotes “socially inclusive school climates where acceptance, respect, and human dignity for all students, is the norm” (Elementary School Playbook, 2020). The UCS approach is the “Unified Movement.” This movement brings together youth with and without intellectual and developmental disabilities through sports and leadership opportunities. This presentation highlights retention rates, focusing on athletes from the 2018-2019 academic year to the present, to gauge the effectiveness of UCS’ programming, as well as highlighting the Unified Recognition Program created and presented by Allyson G. Graves and adopted by Special Olympics Rhode Island.

NURSING

Improving Utilization of the Patient Portal of the Arabic-speaking Population of the Worcester Senior Center

Kayleigh Webert

Faculty Advisor: Amelia DiDomenico-Houghton, M.S., M.S.N.

Poster Presentation – Traditional

The modern health care world is increasingly utilizing health care technology (HIT) for both providers and patients. Patient portals include electronic health records, the quality of care, interactions between doctor and patient, monitoring of health status, and adherence to the prescribed treatment (Carini *et al.*, 2021). There is a discrepancy in access to health care specifically for adults over the age of 65, racial/ethnic minorities, adolescents, and people with low-English-proficiency (LEP). This proposal is looking to create and implement a pilot program that can support the Arabic-speaking seniors at the Worcester Senior Center in overcoming barriers to using their patient portal and other HIT. If successful, this can easily be tailored to the other cultural groups at the senior center that need support to access health care.

OCCUPATIONAL THERAPY

The Effect of Eating Disorders on Young Adults' Social and Educational Participation and Routines

Juliana M. Accetturo

Faculty Advisor: Sarah DiMeo, Ph.D.

Graduate Project

Poster Presentation — Traditional

This study aimed to address the significant gap in understanding the repercussions of eating disorders on individuals' daily routines, educational performance, and social engagement, emphasizing the necessity of support within the realm of occupational therapy. Using a quantitative approach with a semi-structured questionnaire, the investigation revealed that anorexia nervosa, bulimia, and binge eating disorder consistently exert significant influences on individuals' lives, leading to notable alterations and preoccupation with food-related thoughts. Moreover, these disorders were consistently associated

with reduced social interactions, engagement, and moderate shifts in focus, concentration, and academic performance in young adults. This research provided valuable insights into the implications of eating disorders across different facets of individuals' lives, establishing a groundwork for further exploration and targeted interventions within the field of occupational therapy.

The Effect of Sleep and Meditation Apps on College Students

Katelyn E. Alves

Faculty Advisor: Sarah E. DiMeo, Ph.D.

Graduate Project

Poster Presentation — Traditional

College students face unique challenges that place them at an increased risk of poor sleep or sleep deprivation. Because technology use is becoming more prevalent in today's society, apps are being designed to target sleep and meditation. This study explored the use of sleep and meditation apps in college students and how they impact sleep performance. Results indicated that the students who reported using sleep and meditation apps did not show any significant differences in sleep performance.

The Effects of Type 2 Diabetes on Lifestyle

Kerri Elisabeth Barnum

Faculty Advisor: Joanne Gallagher-Worthley, Ed.D.

Graduate Project

Poster Presentation — Electronic

A diagnosis of type 2 diabetes mellitus affects how individuals live their lives compared to pre-diagnosis. This study aimed to identify which aspects of one's lifestyle changed the most after being diagnosed. This qualitative study consisted of seven semi-structured interviews with persons diagnosed with type 2 diabetes three or fewer years ago. Participants identified an increase in health management activities and psychosocial shifts when comprehending the impact of their new reality. Furthermore, findings indicated that participants viewed diabetes self-management regimens favorably and found them easier to adhere to when they experienced familial support.

Nurses' Perception of Occupational Therapy and its Effect on Interprofessional Collaboration

Cortney Marie Barretto

Faculty Advisor: Joanne Gallagher-Worthley, Ed.D.

Graduate Project

Poster Presentation — Electronic

Interprofessional collaboration is vital for creating well-balanced and strong team dynamics. More specifically, within health care settings, collaboration and understanding of medical professionals' roles play a large part in the delivery of health care services and the safety of patients. This study examined nurses' perceptions of occupational therapy and overall understanding regarding occupational therapists and the effect these perceptions had on collaboration within the workplace and comprehensive patient care. Twenty-eight nurses completed a 20-question Google Form survey. Results showed nurses possess adequate knowledge of the roles of occupational therapists and understand the importance of collaboration to increase patient outcomes.

The Effects of Physical Activity and Quality of Life on Academic Success in College Students

Jake T. Barry

Faculty Advisor: Sarah DiMeo, Ph.D.

Graduate Project

Poster Presentation — Traditional

College students live busy lives that are deeply impacted by their routines. With busy schedules, it may be difficult for students to support their own health with physical activity. Physical activity impacts more than just the individual's physical health and can extend to mental well-being and even academic performance. In this quantitative study, 32 students took part in a survey to evaluate their physical activity levels, quality of life, and academic performance. Data gathered showed that there was a positive correlation between higher activity levels and increased emotional satisfaction.

Delirium Prevention in Acute Care

Julie L. Braga

Faculty Advisor: Joanne Gallagher Worthley, Ed.D.

Graduate Project

Poster Presentation — Traditional

The prevalence of delirium in acute care settings is widespread and highly detrimental to long-term health outcomes and overall health care costs. The goal of this research was to investigate nursing staff and occupational therapists' understanding of delirium and delirium prevention in acute care to determine if more education and/or resources are needed. Through semi-structured interviews, it was found that although these staff members feel competent and experienced in the area of delirium prevention, they all desired more education and resources to improve the efficacy of their strategy implementation.

Influences on a Child's Gender Identity

Brooke E. Carey

Faculty Advisor: Joanne Gallagher Worthley, Ed.D. Graduate Project

Poster Presentation — Traditional

This research study explored how parents influence their child's gender identity through social interactions, toys, clothing, and parenting styles. In this quantitative study, 32 participants had at least one child under the age of 15. The parents completed a 20-question survey through Google Forms. The results show that parents influence their children through their own stereotypical beliefs. Parents influence through buying gender-specific clothing and encouraging gender-specific sports for their children.

Older Adults' Knowledge of Assistive Technology for Self-Care Tasks

Amanda D. Chaires

Faculty Advisor: Sarah DiMeo, Ph.D.

Graduate Project

Poster Presentation — Traditional

Assistive technology (AT) is a device or system used to help individuals independently complete activities of daily living (ADLs). This survey aimed to explore older adults' knowledge about AT for ADL use and how this affects their perception of using AT. This data was collected through a survey. The results found that the participants were familiar with AT. When the participants had previous experience with AT, such as taking care of family members with AT, they were more familiar with AT. Lastly, when older adults are more familiar with different types of AT, they are more likely to use AT in ADLs. Overall, occupational therapists should educate older adults about AT to increase their chances of using it to maintain their independence in ADLs.

Impact of Employment on Occupational Balance and Life Roles Among College Students

Delaney R. Crowell

Faculty Advisor: Sarah DiMeo, Ph.D.

Graduate Project

Poster Presentation — Electronic

Pursuing employment while enrolled in college can significantly impact students' ability to engage in other meaningful activities. The purpose of this study was to determine if pursuing employment while enrolled in college impacts individuals' ability to maintain occupational balance and participate in desired life roles, and to determine which factors contribute the most to their need to work while in college. Fifty college students ages 18-26 completed a 29-question survey. The findings from this quantitative study suggest that many areas of students' lives are impacted by working while enrolled in college.

Caregivers' Perspectives on Older Adults' Post-Stroke Function

Emily L. DePiero

Faculty Advisor: Sarah DiMeo, Ph.D.

Graduate Project

Poster Presentation — Electronic

Stroke affects a surplus of older adults in various ways, causing inconsistent deficits. This quantitative study aimed to determine older adults' quality of life, independence, and participation in activities of daily living post-stroke, through the perspective of caregivers. Thirty-one caregivers of stroke survivors completed a survey about their care receiver's challenges post-stroke, and how those challenges have affected care receivers' quality of life, independence, and participation in activities of daily living. The study's results showed that the care receiver's quality of life was seen as possibly affected, that care receivers weren't as independent as they desired, and that their engagement in daily living skills were perceived to be impacted as well.

Emotional Support Animals and College Students

Kathleen E. Flanagan

Faculty Advisor: Sarah DiMeo, Ph.D.

Graduate Project

Poster Presentation — Traditional

A growing population of college students have a registered emotional support animal (ESA) in school to help them manage the symptoms they experience from their mental health illness(es) and/or disability(ies) and maximize their day-to-day function as college students. This study explored the extent to which an ESA improves college students' social participation, education, and overall quality of life. Results indicated the students who participated in the study believed their ESA improved these areas, especially their ability to attend social activities on campus, complete their schoolwork, and manage the symptoms they experience.

The Lived Experience of Individuals Diagnosed with Multiple Sclerosis

Kaleigh R. Grzenda

Faculty Advisor: Joanne Gallagher-Worthley, Ed.D.

Graduate Project

Poster Presentation — Electronic

Multiple sclerosis (MS) is a chronic condition that presents unique barriers and challenges to an individual's ability to engage in meaningful occupations. Through the use of semi-structured interviews, this qualitative research study aimed to understand the impact of MS on individuals' lifestyles and their perceptions surrounding their lived experience. Results suggest that, despite having familial and employer support, individuals with MS experienced a negative diagnostic journey, with disruption in their social and vocational engagement.

Exploring General Education Teachers' Understanding of the Role of School-Based Occupational Therapy

Jordan E. Houston

Faculty Advisor: Sarah DiMeo, Ph.D.

Graduate Project

Poster Presentation — Traditional

School-based occupational therapists help students participate in educational activities a student needs to do or wants to do in order to succeed in school. The purpose of this quantitative study was to gain insight on teachers' understanding of occupational therapists' role in school-based settings. The results of this study showed that communication frequency between teachers and occupational therapists seemed to affect teachers' understanding of the role of school-based occupational therapists.

Occupational Therapy Student Support in the Least Restrictive Environment

Emily A. Laventure

Faculty Advisor: Sarah DiMeo, Ph.D.

Graduate Project

Poster Presentation — Traditional

The purpose of this study was to identify what exact methods and practices current-practicing school-based occupational therapists use to support students' educational and functional success in the least restrictive environment. In this qualitative study, eight school-based occupational therapists participated in semi-structured interviews about how they best support students in the least restrictive environment. The findings of this study indicate that school-based therapists collaborate with teachers through consultative methods, educate teachers by providing indirect services, and utilize universal design for learning concepts to support students' success in their least restrictive environment.

Impact of Technology on Older Adults' Participation in Driving and Community Mobility, Social Participation, and Communication Management

Anna V. Lowd

Faculty Advisor: Sarah DiMeo, Ph.D.

Graduate Project

Poster Presentation — Electronic

Technology is rapidly changing and older adults have had difficulty adjusting to the various new ways society depends on technology. This study investigated the impact technology has on older adults specifically with driving and community mobility, social participation, and communication management. This study surveyed 34 participants who were 65 years and older, utilizing an 18-question survey, to determine how technology such as smartphones, social media, and GPS devices has impacted their participation in the aforementioned domains. The findings suggested older adults' communication with others has increased and technology found in the car, such as a GPS device, has not negatively affected their community mobility. These findings can provide more focused occupational therapy interventions to support technology use and participation in meaningful occupations.

The Effects of Work-Related Musculoskeletal Disorders and Classroom Ergonomics on Special Education Personnel

Ariella Manno

Faculty Advisor: Joanne Gallagher Worthley, Ed.D.

Graduate Project

Poster Presentation — Traditional

Work-related musculoskeletal disorders (WMSD) are common among special education personnel. This study surveyed 30 special education teachers and paraprofessionals about the job-related factors contributing to WMSD. Results showed that lead special education teachers reported an increase in back pain as a result of caretaking in their classrooms. With these findings, school-based occupational therapists can better educate and serve their fellow special education colleagues to promote their own health and well-being while providing effective education to students.

The Effect of Sensory Processing Challenges on a Child's Daily Occupations: A Caregiver Perspective

Willow Sage Normandin

Faculty Advisor: Sarah DiMeo, Ph.D.

Graduate Project

Poster Presentation — Electronic

The purpose of this study was to explore caregivers' perspectives of the impact of sensory processing challenges on their child's daily occupations. The goal was to determine how sensory processing challenges affected children's daily routines, what sensory-based strategies were most beneficial, and how social participation and communication were affected. In this qualitative study, seven caregivers of children aged three to seven participated in semi-structured interviews about the impact of sensory processing challenges on their daily occupations. This study revealed that emotional and behavior regulation, along with peer group and family participation, are impacted by sensory processing challenges. This study also revealed parent education and services contributed greatly to learning effective sensory-based strategies to utilize within the home.

Resilience of Individuals with a Spinal Cord Injury

Jessica S. Potenza

Faculty Advisor: Joanne Gallagher Worthley, Ed.D.

Graduate Project

Poster Presentation — Traditional

This qualitative study aimed to understand how individuals bounce back from difficult times and cope with the negative consequences of a spinal cord injury (SCI). Six participants were recruited for this study, and each participated in a semi-structured interview to gather their perspectives about their ability to adjust to life with a SCI. This research study found that developing a positive outlook on life supported participants in overcoming challenges during their SCI recovery. A pivotal moment in the participants' recovery was the acceptance of their SCI, as this acceptance fostered their perseverance to get through adversity.

The Use of Smartphone Apps on Leisure Life Balance of Employees in Administrative Roles

Teagan M. Quill

Faculty Advisor: Joanne Gallagher, Ed.D.

Graduate Project

Poster Presentation — Traditional

Balancing work and non-work life is a common struggle for many, especially those in managerial or administrative positions. With the increase in smartphone app usage both in and out of the workplace, an employee can be reached through their phone at any time of the day regardless of their location. This study examined managers' and administrators' perceptions of how having unlimited access to their work through work-related apps impacted their ability to maintain their work-life balance. The results show that while many people perceive that they have work-life balance, almost all have personal expectations of themselves to answer work-related communications outside of working hours.

The Effect of Senior Living Communities on Social, Leisure, and Sleep Participation

Alexa Ricker

Faculty Advisor: Sarah DiMeo, Ph.D.

Graduate Project

Poster Presentation — Electronic

Transitioning into a senior living community can alter or affect an individual's daily occupations and routines. The purpose of this study was to examine the effects of moving into senior living communities on older adults' social, leisure, and sleep participation. This qualitative study consisted of six semi-structured interviews with older adults residing in a senior living community. The findings of this study revealed that moving into the community has resulted in positive effects on individuals' social participation, leisure participation, and sleep participation. Furthermore, participants expressed improvements in various aspects of their lives upon moving, including accessibility, security, and control. These aspects were noted as themes. The information gathered from this study can be used to promote senior living communities to older adults looking to move.

The Effects of the Sober Lifestyle

Catalina M. Ulloa-Hiltz

Faculty Advisor: Joanne Gallagher Worthley, Ed.D.

Graduate Project

Poster Presentation — Electronic

Alcohol use disorder (AUD) is a serious public health concern. Struggling with addiction is extremely difficult, as it can affect many areas and pose many hardships within an individual's life. Addiction is relentless and unforgiving; it has the potential to interfere greatly with an individual's roles and responsibilities. Little research has been conducted in examining the shift in an individual's quality of life (QoL) from being actively addicted to alcohol to when in recovery, and pursuing a sober lifestyle. Results from this qualitative study, which utilized a semi-structured interview format, show clear overall improvements in the roles, habits, routines, and overall QoL of all participants who are now pursuing a sober lifestyle.

Social Isolation in Young Adults

Mikayla D. Wilcox

Faculty Advisor: Joanne Gallagher Worthley, Ed.D.

Graduate Project

Poster Presentation — Traditional

Social participation has been known to benefit the overall health and wellness of an individual. Unfortunately, social isolation (SI) has become more prevalent, especially among young adults (18-25 years of age). This study employed semi-structured interviews to identify the prevalence and circumstances surrounding increased SI, while also discerning existing coping mechanisms. Results showed that within this sample, SI was not only associated with external factors, but was also associated with limited coping mechanisms; as such, these individuals could benefit from further education on the subject.

The Effects of a Spinal Cord Diagnosis on a Client's Occupational Performance

Anna Catherine Wrenn

Faculty Advisor: Joanne Gallagher Worthley, Ed.D.

Graduate Project

Poster Presentation — Traditional

Spinal cord injury survivors encounter many unparalleled challenges post-diagnosis. This qualitative study explored the overall effects that a spinal cord injury diagnosis had on seven individuals' lives and quality of life, and how this negatively affected social participation, community mobility, and led to an overall loss of independence when heavily relying on family members and caregivers. Results indicated that each individual did experience temporary role disruptions and a loss of meaningful activities but was able to achieve an overall satisfactory quality of life. Occupational therapists have the unique role in the ability to advocate for individuals with this diagnosis within their workplace and other leisure pursuits, as well as provide them with assistive technology that is best suited for their meaningful occupations.

High Assistive Technology and Lived Experiences

Catherine A. Yeargin

Faculty Advisor: Joanne Gallagher, Ed.D.

Graduate Project

Poster Presentation — Traditional

The purpose of this study was to analyze individuals' lived experiences with high assistive technology (AT), with a focus on powered wheelchairs. The study focused specifically on how AT affected individuals' environmental and social inclusion, and on what type of impact AT had on their lives — whether AT provides a positive or negative effect, and understanding the support the participant received from family. Six participants were interviewed through Zoom/phone call and were asked questions to find out this information. Results showed that most participants who utilize high AT — specifically, powered wheelchairs — found that high AT positively impacted their lives.

Canadian Residential Schools: Addressing the Past

Grace M. Beckman

Faculty Advisor: Henry C. Theriault, Ph.D.

Oral Presentation

Beginning in the late 1800s, Canadian leaders removed 150,000 Métis and Inuit children from their families, isolating them from their own heritage and culture. These individuals were robbed of their family, education, freedom, and future. The events that occurred cannot be undone; however, with admittance of cruelty and wrongdoing, sincere apologies, and memorials, loved ones can be positively impacted. By implementing new regulations and sacrificially giving up their sense of superiority and authority, members of the perpetrator group can show they accept accountability. Through symbolic and material reparations and acknowledging differences in traditions and beliefs, the perpetrators and victim groups can move toward a more harmonious community.

Conflict on the Israeli-Gaza Strip Border

Erin Rose Condon

Faculty Advisor: Henry C. Theriault, Ph.D.

Oral Presentation

On October 6, 2023, Hamas entered Israel, inflicting harm on citizens through kidnapping and murder. The Israeli government responded militarily. Neither Israelis nor Gazans are safe while Hamas and Israel vow to destroy each other. This presentation will apply William Bradford's eight stages of redress for a past atrocity, including acknowledgment, apology, peacemaking, commemoration, compensation, land restoration, legal reformation, and reconciliation. The discussion will include a commitment to rebuilding and providing a symbol for the harm done at the site of the music festival. For compensation and land restoration, Israel should rebuild hospitals, schools, neighborhoods, and remove tunnels. For legal reformation, Gazans and Hamas will participate in the Israeli political process. Achieving reconciliation could prevent the stain of atrocities from passing on intergenerationally.

Reparations for East Timor

Thomas Flaherty

Faculty Advisor: Henry C. Theriault, Ph.D.

Oral Presentation

For two decades, East Timor endured a brutal, overlooked genocide, claiming 250,000 lives amid Indonesian aggression aided by the United States. The Timorese suffered sexual violence, dire conditions, and identity suppression. Violence persisted despite sporadic intervention until a fragile peace emerged in 1999, leaving enduring scars. Cultural upheaval grips East Timor, echoing the tragedy's aftermath. The Timorese grapple with reconstruction amidst global indifference. Confronting past injustices is imperative. This initiative proposes reparations to address the genocide's impacts, fostering reconciliation and development. Acknowledging atrocities and aiding East Timor is crucial for a fairer future.

Reparations and the "Comfort Woman" System

Lea Gaspar

Faculty Advisor: Henry C. Theriault, Ph.D.

Oral Presentation

The "comfort woman" system was a brutal form of sexual slavery imposed by the Japanese military during the wars of the 1930s and 1940s. From 1932 to 1945, an estimated 200,000 women were enslaved. The lasting effects are evidence of a historical atrocity characterized by massive human suffering and violations of human rights. Despite the time that has passed since this occurred, some victims survive to this day, left wounded by the trauma that they were put through. Justice and reparations need to be made. This presentation will examine various reparation possibilities to address the many harms survivors are impacted by. It will consider possible paths, including apologies and compensations, along with non-financial reparations such as educational initiatives and mental health/emotional support programs.

Life After Mass Atrocities: A Psychological Perspective on Reparations

Andja Kola

Faculty Advisor: Henry C. Theriault, Ph.D.

Oral Presentation

As the world keeps experiencing mass atrocities, the importance of reparation packages aiming to better the aftermath of mass violence is becoming more prominent. The trauma coming from complex destruction causes a rupture from reality that impacts the way individuals see themselves and the world (Danieli 1998) and creates an intergenerational burden in the victim group. The addition of psychological tools to the framework of reparations and transitional justice can improve the mental health of the victims and the relationships between populations. This project aims to explain the significance of therapy and other tools, while analyzing the possible outcome of this addition to the parts of the justice system.

The Armenian Genocide: Redefining the Definition of Genocide to Help Prevent Violence Against Women and Girls

Ryanne McGowan

Faculty Advisor: Henry C. Theriault, Ph.D.

Oral Presentation

Genocide typically affects women and girls differently from how it affects men and boys. The killings, which are the most visible acts of genocide and people see as defining genocide, disproportionately affect men and boys in comparison to women and girls, while sexual violence disproportionately impacts women and girls. In the case of the Armenian Genocide, many women and girls were victims of sexual violence. Based on lessons from the Armenian case, this project will develop an approach to identifying when sexual violence is a warning sign of genocide and to preventing escalation into genocide.

Reparations for the “Comfort Women” System

Carissa E. McKee

Faculty Advisor: Henry C. Theriault, Ph.D.

Oral Presentation

The “comfort women” system was implemented by the Imperial Japanese Armed Forces between 1937-1945. The system provided soldiers with enslaved women and girls for sexual exploitation. Given Japan’s failures regarding adequate education, recognition, and reparation, measures must be taken to acknowledge the impact of this system on individual victims and world history. My project will address reparations for the “comfort women” system, including symbolic monuments, education, and economic security for survivors and descendants, as well as the creation of an organization funded by Japan, dedicated to elimination of sex trafficking culture and practices.

Reparations for the Vietnam War

Nicholas M. Nassar

Faculty Advisor: Henry C. Theriault, Ph.D.

Oral Presentation

The Vietnam War was many things: a bloody conflict, a war in foreign lands, maybe a mistake as well. Both sides, Vietnamese and Americans, lost many people, though Vietnam lost 2 million lives while being a country with one-third of the United States’ population, compared to the 58,000 American lives lost. The Red Scare was one reason for America to launch this war, as part of the war against Communism and the Cold War. The United States has never paid reparations despite the losses suffered by the Vietnamese at American hands. This paper offers a reparations plan to address this.

Bosnian Genocide Redress and Reparations

Daniel C. Parker

Faculty Advisor: Henry C. Theriault, Ph.D.

Oral Presentation

The Bosnian genocide consisted of crimes against humanity and ethnic cleansing that occurred during the Bosnian War from 1992 to 1995. Roughly 100,000 lives were lost as a result of this tragedy, with around 80 percent of them being Bosniak. There are two major components to this case: the Srebrenica Massacre and the wider crimes against humanity perpetrated by the Army of Republika Srpska, including systematic mass rape. As of today, there is still a large number of genocide deniers. Denial not only continues the harm but creates the possibility of future harm. I aim to create a reparations package that addresses not only the original violence but also the impact of denial on the Bosniak people.

Reparations for the Nanjing Massacre

Abigail Peters

Faculty Advisor: Henry C. Theriault, Ph.D.

Oral Presentation

The Nanjing Massacre occurred in China in 1937-38. After conquering the city of Nanjing and surrounding areas, the Japanese army killed and/or raped many civilians and prisoners of war. The Japanese government has since widely ignored the facts and minimized or omitted it in/from school textbooks. The event and its denial impact survivors. The youngest survivors of this massacre would be in their late 80s now and might still have trauma from the event, while later generations might be experiencing intergenerational trauma. The soldiers that committed this atrocity were never punished and are most likely all dead by now, so criminal justice is not possible. This presentation will argue for another form of repair for victims and their families.

Reparations for Belgium's Actions in the Congo

Joanna B. Presume

Faculty Advisor: Henry C. Theriault, Ph.D.

Oral Presentation

Under Leopold II, Belgium acquired the Congo in 1885 and exploited its people. Many Congolese people suffered getting rubber for the Belgians. Some had their hands and feet cut off, which was a death sentence for a farmer, and mothers and daughters were taken captive. Between five and 10 million people were killed. This stain on history has left its legacy. It resulted in a severe labor shortage that delayed the country's development. Deforestation continues to this day. Because of this genocide, the Congo remains dependent on the very people trying to exploit them. A proper reparation is a must in this situation. Belgium's current method of repair is insufficient, so I propose a reparation scheme that would help the Congolese people heal.

Reparations for Forced Sterilization in the United StatesMorgan Stelmokas *Faculty Advisor:* Henry C. Theriault, Ph.D.

Oral Presentation

Women have been subjected to reproductive control and abuse throughout our nation's history, often perpetuated by the U.S. government, including forced sterilization. Forced sterilization occurs when someone is coerced into or receives misinformation about the medical process of sterilization. From the 1920s to the 1970s, between 100,000 and 150,000 women were sterilized in the United States without their consent, impacting their ability to make their own decisions about their reproductive rights. Given the irreversible nature of sterilization and the fact that all victims are either dead or past childbearing age, the United States must acknowledge the wrongdoing and provide support and care not only for living victims, but also for women fighting to maintain their reproductive freedoms today.

PSYCHOLOGY**The Relationship Among Emotion Regulation Strategies, Alcohol-Related Problems, and Coping Motives, as Moderated by Gender and Pandemic Positionality**

Riane E. Anderson

Faculty Advisor: Alexandra M. Burgess, Ph.D.

Funding Source: WSU Summer Undergraduate Research Grant

Commonwealth Honors Project

Poster Presentation — Traditional

This project focuses on the relationship between emotion regulation strategies (cognitive reappraisal and expressive suppression), alcohol-related problems (lifetime/past-year occurrence, and past-year severity) and coping with alcohol, as moderated by gender and pandemic positionality (early and late pandemic). College students ($n = 1,412$) from three universities were sampled. Regression-based moderation analyses were utilized on a data set including the following measures: Young Adult Alcohol Problems Screening Test (YAAPST), Emotion Regulation Questionnaire (ERQ), and a coping with alcohol item. Using alcohol to cope was found to be significantly, negatively correlated with cognitive reappraisal (looking at a situation differently to change one's emotions) and significantly, positively with expressive suppression (hiding one's emotions). Correlations between the ERQ and the YAAPST, along with the overall moderation model, were not significant.

The Intergenerational Transmission of Intensive Parenting Beliefs Among Contemporary Mothers

Alix P. Barry

Faculty Advisors: Kathryn E. Frazier, Ph.D.; Emily G. Soltano, Ph.D.

Funding Source: WSU Summer Undergraduate Research Grant

Poster Presentation — Traditional

This study investigates the intergenerational transmission of intensive mothering beliefs and their adaptation to contemporary parenting practices. Intensive mothering is a gendered parenting ideology that emphasizes mothers' investment of time, energy, and resources in raising children. While the transmission of parenting behaviors has been studied extensively, few have focused on the intergenerational transmission of intensive mothering beliefs. Using a cultural lens, this study examines how contemporary mothers reinterpret, reclaim, or discontinue intensive mothering dimensions in their parenting practices. Thematic analysis of interviews with 26 mothers reveals the significance of the family as culture, the role of past experiences in shaping contemporary mothering practices, shifting parental landscapes, and the challenges mothers face in reconciling societal expectations.

What's in a Story: Exploring Developmental Themes in Children's Books

Scout Beaudoin, Jessica Rancourt

Faculty Advisor: Colleen Sullivan, Ph.D.

Funding Source: Worcester State Foundation Student Research, Scholarship, and Creative Activity Grant

Commonwealth Honors Project

Poster Presentation — Traditional

Reading from an early age can tremendously impact the ability to learn and comprehend later in life. Children's literature is not just for entertainment; it is a pillar in educating children on essential topics necessary for cognitive, social, and emotional development. We examined 14 popular children's books utilizing content analysis to decipher the words and illustrations that explore societal topics for young readers. After examining the materials, we identified several themes surrounding schooling (e.g., *Ada Twist*), friendship (e.g., *The Good Egg*), and leadership (e.g., *Sofia Velez*). These findings help teach children lessons while providing communication points to caregivers who can incorporate these topics at home.

Perceiving Threat, Experiencing Negative Thoughts, and Feeling Lonely? You Are Not Alone.

Kate E. Desruisseaux; Chelsea M. Colageo; Nyah Thomas; Rebecca Hillard

Faculty Advisor: Champika K. Soysa, Ph.D.

Poster Presentation — Traditional

Mental distress in 18-29 year-olds is higher than in other adults. Identifying concurrent psychological processes that could modulate the positive relationship between appraisals of events as threatening and higher levels of stress would be beneficial. Using a combined correlational and group comparison design, we investigated $n=266$ and $n=318$ undergraduates in spring and fall 2020, respectively. At both times, 40 percent of participants were first-generation college students (FGCS). Persistent negative thinking (positively) and mindful non-judging (negatively) partially accounted for the positive relationship between threat appraisal and stress, but loneliness and resources did not, both in FGCS and non-FGCS, and in both spring and fall 2020. These findings could inform targeted interventions to reduce mental stress in undergraduates if these patterns persist post-pandemic.

Comparison Promotes Adults' Comprehension of Science Diagrams

Andja Kola; Giana Rivera

Faculty Advisor: Benjamin Jee, Ph.D.

Poster Presentation — Electronic

Multiple diagrams are often used to convey complex scientific ideas. Yet, even when analogous diagrams are provided, students might not draw the right connections. We tested whether an explicit comparison prompt would help university students make scientifically relevant connections between diagrams of evolution. Participants were shown two analogous diagrams showing the evolution of different species. Those in the High Comparison Support condition compared the diagrams and matched three pairs of organisms across them. Participants in the Low Comparison Support condition matched only one pair of organisms. We found that those in the High Comparison Support condition were significantly more likely to match organisms in terms of their role in the evolutionary process. Thus, support for comparison can help students think scientifically.

Social Contextual Model of Sexual Violence Perpetration: the Impact of Exposure and Drinking

Andja Kola, Anna Rideout, Abigail Rose

Faculty Advisor: Sarah R. Eagan, Ph.D.

Poster Presentation — Traditional

Sexual Violence (SV) is a major public health crisis. Recent work has aimed to integrate social-contextual risk factors present in patriarchal societies and sexual violence perpetration by straight/cisgender men (Eagan, 2021). One of these factors includes how alcohol use and SV are heavily intertwined (Abbey, 2011; Gervais et al., 2014). Additionally, witnessing peers engage in SV behaviors has been associated with self-reported SV perpetration (Humphrey and Kahn, 2000). We found that men who had witnessed a peer/friend perpetrate SV also reported committing SV, mediated through the influence of men's drinking motivations (conforming, enhancing the mood, socializing, and coping). This work can help to further disentangle the complex connection we see between SV perpetration and alcohol.

The Role of Race in Facial Memory Specificity

Olesya J. Kyrychok; Cara C. Prunier

Faculty Advisor: Brittany M. Jeye, Ph.D.

Commonwealth Honors Project

Poster Presentation — Traditional

Research has shown that humans can remember substantial amounts of information in long-term memory and that these memories are highly detailed. Additionally, researchers have demonstrated that races similar to one's race are remembered more clearly than faces of different races (a phenomenon called the other-race effect). This study evaluated memory specificity for faces of other races. Participants viewed a series of original face stimuli of different races. They were then shown old faces, related faces, and new faces and indicated whether the faces were the same as the originals. Analyses are investigating how memory for facial details changes depending on the face's race. Furthermore, we are examining whether the race of the different face stimuli influences whether similar facial details are inhibited in memory.

How Does Item Memorability Influence the Attentional Blink?

Amy L. MacGlashing; Samantha R. Kelleher

Faculty Advisor: Brittany M. Jeye, Ph.D.

Poster Presentation — Traditional

Previous research has found that individuals are less likely to perceive a target item when it directly follows an emotionally evoking one (i.e., "emotion-induced blindness", a type of attentional blink). Our previous experiment focused on determining whether the memorability of an item induces an attentional blink. Participants were asked to spot a single target within a rapid serial visual presentation where an image of high, low, or neutral memorability preceded the target as a distractor by either two or eight images. Filler images were of neutral memorability. We found no differences in attentional blink across levels of memorability. For our current study, the filler images are changed to those of low memorability to investigate differences in the attentional blink across different levels of memorability.

Peer Mentors' Impact on the Applied Research Methods Course

Phoebe G. Nelson; Emily A. Salonich; Katherine J. McMeniman

Faculty Advisor: Emily G. Soltano, Ph.D.

Commonwealth Honors Project

Poster Presentation — Traditional

While it has been shown that peer support is helpful for students, there is less information on the benefits of peer mentoring for the mentors and overall class structure. We predict that undergraduate peer mentors' participation in a research-based course will positively impact both students and mentors in their understanding of research concepts, and help peer mentors to gain additional leadership skills. We compared students' confidence in key research concepts and processes for students enrolled in applied research methods courses, with and without peer mentors. Preliminary quantitative and qualitative data analysis appears to confirm our hypotheses.

Burnout and Loneliness in Relation to Mental Stress and Well-being in College Students Late in the COVID-19 Pandemic

Amanda Pollicelli; Brendan Castle; Christina Howland; Emma Found

Faculty Advisor: Champika K. Soysa, Ph.D.

Poster Presentation — Traditional

Mental distress among 18-29 year-olds in the U.S. in September 2020 was similar to levels reported in September 2022, 2.5 years into the COVID-19 pandemic (U.S. Census Bureau, 2020-2022). Identifying psychological factors associated with mental stress and well-being would be useful. Burnout (emotional exhaustion, cynicism, and personal efficacy) and loneliness were investigated as concurrent predictors of mental stress and well-being among 376 undergraduates in late fall 2022. The research questions in the current project use complex correlational methodology to address: 1) whether emotional exhaustion, cynicism, and loneliness positively predict stress and inversely predict mental well-being and 2) whether personal efficacy positively predicts mental well-being and inversely predicts stress. Analyses could differentiate psychological factors that predict mental stress from those that predict mental well-being.

Bringing the Library Home: Fostering Library Engagement and Family Involvement

Jessica Rancourt, Scout Beaudoin

Faculty Advisor: Colleen Sullivan, Ph.D.

Funding Source: Worcester State Foundation Student Research, Scholarship, and Creative Activity Grant

Commonwealth Honors Project

Poster Presentation — Traditional

Storytime is one of the most common activities that caregivers and children engage in for early literacy. To educate and encourage caregivers about the importance of fostering these interactions, we developed a caregiver-child book club whose purpose is to explore the ways caregivers can engage with the content of the book through conversations about the text and illustrations. This book club incorporates conversation starters to keep the children engaged and talking about the text, as well as an activity related to the book's theme. By developing this program, caregivers have an enhanced opportunity to help foster and enhance their child's early literacy skills and interest. Results evaluate use of conversation starters, interest in text, and the home literacy environment.

How the Endorsement of Masculine Role Norms Mediates the Relationship Between Frequency of Pornography Use and Sexual Violence Perpetration

Abigail Rose; Andja Kola; Anna Rideout; Eva Thompson

Faculty Advisor: Sarah Eagan, Ph.D.

Poster Presentation — Traditional

Sexual Violence (SV) has been a prevalent and persistent issue for many years. Prior research has shown a positive relationship between pornography use and intimate partner SV, where pornography functions as a normative sexual script focusing on men's pleasure by dehumanizing women (Tarzia and Tyler, 2021). Additionally, men's endorsement of playboy, power over women, and heterosexual self-presentation norms has been positively correlated with SV perpetration (Cole et al., 2020). Based on data from Dr. Eagan's dissertation, this project found an indirect effect of pornography on men who endorsed the masculine playboy role norm as a mediating factor, based on their reporting a higher frequency of pornography use and committing acts of SV. This research furthers understanding of the intricacies of the relationship between pornography and sexual violence.

SOCIOLOGY

Enhancing Mental Health and Stress Management for Preschool Daycare Staff in Massachusetts: A Collaborative Intervention

Katelyn I. Bindas

Faculty Advisor: Kevin Kane, MPIA

Oral Presentation

This research delves into the often-neglected mental health of daycare staff in Massachusetts, and proposes a collaborative intervention to address these issues. A mixed methods approach of qualitative interviews and surveys allows clear insight on obstacles these workers face, and their critical role in shaping young lives. This research highlights systematic challenges such as low pay, limited resources, and limited support affecting staff's well-being. By advocating for a CBPR approach, this paper aims to influence stakeholders to initiate efforts toward a supportive environment, prioritize mental health, increase pay, and incorporate professional development for staff. These findings enhance the importance of collaboration in transforming Massachusetts' education landscape and providing optimal care for children.

Murder Houses to Haunted Houses: Monetizing (Dis)belief in the Paranormal

Savannah Stowe

Faculty Advisor: Alex Briesacher, Ph.D.

Oral Presentation

This research explores the intersection of sociology and paranormal belief structures, navigating the social construction of paranormal activity surrounding spaces marked by tragedy. Through a series of case studies, the research investigates societal perceptions of locations associated with mass/high-profile murders. Furthermore, a content analysis is conducted on select properties transformed into "Haunted Houses," inviting paying visitors to explore the possibility of engaging/witnessing the presence of paranormal activity. This study examines the complex interplay between belief, disbelief, and skepticism of the paranormal in societal collective consciousness, from the commodification of tragedy to the commercialization of supernatural encounters.

VISUAL AND PERFORMING ARTS

“Que Sera, Sera”: An In-depth Look into Inequality on the Haitian-Dominican Border Mariana Velez

Faculty Advisor: Jennifer Hood-DeGrenier, Ph.D.

Video Presentation

“Que Sera, Sera” is a documentary focused on the complex socio-political landscape of the Haitian-Dominican border. Through interviews and candid footage, the film delves into the realities of inequality that is day-to-day life for Haitian sharecroppers in the Dominican Republic. The film explores the systemic discrimination enforced by the Dominican government and Western corporations onto Haitian migrants searching for stable income and basic human rights. “Que Sera, Sera” offers a raw portrayal of human resilience, compassion, and humanitarianism amidst adversity. It asks viewers to take a step into the uncomfortable truths about power dynamics, identity, and human life in this volatile borderland.

SPECIAL EXHIBITION: Exploring Cultural Differences Through Study Abroad

Students traveling abroad during the 2024 spring break through two courses, the Communication Department's CM 210: Ireland in Image and Text and the Psychology Department's PS 295: Aging in Global Society, explored cultural differences to develop a deeper appreciation for and understanding of differences and diversity. These opportunities prepared students to address these issues with diversity and equity in mind. Exposure to different people, cultures, and locations is an essential component of a well-developed understanding of the world around us. Students traveling to Ireland explored Irish culture through writing, journalism, film, and photography. Students will present their research and creative projects analyzing how history, politics, and the media influence writing and visual storytelling. Students traveling to Portugal explored how aging trends intersect with culture and geography from various perspectives. Students will present their findings on cultural differences in policy, practice, customs, and attitudes about aging in a global society.

CM 210: Ireland in Image and Text

Department of Communication

Faculty Advisor: Daniel Hunt, Ph.D.

Funding Sources: Sheehan Family Funds; Corcoran Family Funds; Alumni Association's Advisory Board

Poster Presentations — Traditional

A Cross-Cultural Analysis of Health Care Systems

Ryanne McGowan; Hannah Rose

Exploring Nature and Green Spaces in Ireland

Sarah White; Paul Davey; Amber Melanson

A Cultural Analysis of Ireland's Relationship with the United Kingdom

Madison Dungey; Brody Miller

Irish Myths and Folklore: History, Culture, and Modern Influence

Delaney DeNorscia; Jordan Staples

The Peace Walls of Northern Ireland

Jada Poland; Christopher Bunnell

An Exploration of Irish Culture Through Third Places

Katherine McMeniman; Juliana Kallio

The Influence of Irish Music on Social Issues

Joseph Shea; Jaliana Colon

Modern Art and Culture in Ireland

Raeann Bazin; Ella Hatcher

Race and Race Relations in Ireland

Empress Stewart

The History of the Irish Language

Alexzander Tetreault

PS 295: Aging in Global Society

Department of Psychology

Faculty Advisors: Emily Soltano, Ph.D.; Nicole Rosa, Ph.D.

Funding Sources: Sheehan Family Funds; Corcoran Family Funds; Alumni Association's Advisory Board

Poster Presentations — Traditional

Aging, Access, and Attitudes: Mental Health in Portugal

Alix Barry; Mandy Pollicelli

Accessibility of Transportation When Traveling to Portugal

Lelu Hamilton; Sophia Mavrikis

Older Adults' Involvement in Social Events and Its Impacts

Claudia Oliveira de Paiva; Isabella Lacorcica

Top 10 Things to Try When in Portugal!

Grace Laubenstein; Abbey Millman

Social Services in Portugal vs. the United States

Jennessa Mcquade

European vs. American Accessibility Legislation

Kiera Mills

Family Dynamics in Older Adults

Yadalisse Norford; Vanessa Nuamah

Aging in Motion: Accessibility and Mobility in an Aging World

Hannah Mailloux; Mason Lavache

The Office of Academic Affairs thanks the many faculty members who advised students in preparation for their Celebration of Scholarship and Creativity presentations and the many staff members whose work supports this signature event in a variety of ways. The Office of Academic Affairs gives special thanks to the following people who made this event possible.

Diane Giombetti Clue, Consulting Copy Editor

Caitlin Kincaid, Assistant Director of Conference and Events Services

Meredith R. Bond, Operations Coordinator for Conference and Events Services

Mark LaCroix, Director of Publications and Printing Services

Lisa McCormack, Design Artist, Publications and Printing Services

Chukwudi Ezeala, Graduate Assistant for Research

Maureen Stokes, Assistant Vice President for Communications and Marketing

The Research Advisory Board

Henry C. Theriault, Ph.D. (Chair), Associate Vice President for Academic Affairs

Gregory Bares, Interim Director, Office of Grants and Sponsored Research

Daron Barnard, Ph.D., Professor of Biology and Director of the Imoigele P. Aisiku, M.D., '92 STEM Center

Matthew Bejune, Executive Director of the Library

Robert Brooks, Ph.D., Professor of Criminal Justice and Chair of the Institutional Review Board

Allison Dunn, Ph.D., Professor in and Chair of the Department of Earth, Environment,
and Physics, and Research Integrity Officer

Roger Greenwell, Ph.D., Associate Professor of Biology and Co-Coordinator of the Biotechnology Program

Anna Griffin, Pre-Awards Grants Officer, Office of Grants and Sponsored Research

Julie Habjan Boisselle, Faculty Development Specialist, Center for Teaching and Learning

Linda Larrivee, Ph.D., Dean of the School of Science, Technology, and Health

Raynold Lewis, Ph.D., Dean of Education, Liberal, and Interdisciplinary Studies

William Lundmark, M.L.I.S., M.A., A.H.I.P., Electronic Resources Librarian

Russ Pottle, Ph.D., Dean of Humanities and Social Sciences

Emily Soltano, Ph.D., Professor of Psychology and Director, CTL: Faculty Development Center

Randall Tracy, Ph.D., Professor of Biology and Chair of the Institutional Animal Care and Use Committee

Jaime Vallejos, Ph.D., Assistant Professor of Health Sciences

Weichu Brian Xu, Ph.D., Associate Professor of Chemistry



WORCESTER
S T A T E
UNIVERSITY

486 Chandler Street • Worcester, MA 01602
www.worcester.edu