

CELEBRATION OF
SCHOLARSHIP
& CREATIVITY



WORCESTER
STATE
UNIVERSITY

2023

2023 Panel Presentation Schedule

Time	Location	Presentation 1	Presentation 2	Presentation 3
8:30-9:20	Wellness Center, Room 204	Intersectionality and Witch Hunting in Early Modern Europe Andja Kola <i>Faculty Advisor:</i> Henry Theriault, Ph.D.	The Ghost Dance and the Wounded Knee Massacre: Was U.S. 19th-Century Domestic Policy the Culprit? Caitlyn M. Ferrecchia <i>Faculty Advisor:</i> Joshua Koenig, Ph.D.	Choiceless Choices: What Lies on the Other Side? Kimberly T. Vo <i>Faculty Advisor:</i> Henry Theriault, Ph.D.
9:30-10:20	Wellness Center, Room 204	International Students' Post-Graduation Immigration Choice Aspen Zheng <i>Faculty Advisor:</i> Carl Herrin	Brain Coup Karen P. Higgins <i>Faculty Advisor:</i> Riley McGuire, Ph.D.	Annotation and Comparative Analysis of Insulin-like Peptides and Their Interacting Genes across <i>Drosophila</i> Species Logan T. Cohen <i>Faculty Advisor:</i> Daron Barnard, Ph.D.
10:30-11:20	Wellness Center, Room 204	Heart Data Evaluation: A Societal Health Reflection Mike Morley <i>Faculty Advisor:</i> Elena Braynova, Ph.D.	School-Based Dietary Interventions: A Systematic Review Eliana H. Singer; Ashley Goncalves <i>Faculty Advisor:</i> Elinor Fondell, Ph.D.	Tatnuck Brook Watershed Habitat Assessment Emily Maynard <i>Faculty Advisor:</i> William Hansen, Ph.D.
11:30-12:20	Wellness Center, Room 204	Searching for a Benzene Proxy throughout the Earliest Stages of Star Formation Brayden J. Wilcomb <i>Faculty Advisor:</i> Andrew Burkhardt, Ph.D.	El Niño and Its Effects on Net Primary Productivity Gurmitt Dhaliwal; Umutoni Helene; Paul Martino <i>Faculty Advisor:</i> Nabin Malakar, Ph.D.	Spectral Imaging of Shocked Regions in HH114 Cameron M. Prosser <i>Faculty Advisor:</i> Andrew Burkhardt, Ph.D.
12:30-1	Wellness Center, Room 204 <i>Special Creative Writing Session</i>	Cherry Stones and Jagged Carboard Karen P. Higgins <i>Faculty Advisor:</i> Elizabeth Bidinger, Ph.D.		

CELEBRATION OF SCHOLARSHIP & CREATIVITY

Welcome to the sixteenth 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

How Does Macroinvertebrate Community Composition Vary within Different Months in the Tatnuck Brook Watershed?

Briana J. Chang; Steven Humphrey; Zachary Trudell; Katie Steeves; Kari Mickunas; Caitlin Dellert; Alyssa Hammond
Faculty Advisor: Diana Sharpe, Ph.D.

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

Poster Presentation — Traditional

In temperate streams, abiotic variables like temperature and dissolved oxygen vary throughout the year and this may result in seasonal variation in macroinvertebrate community composition. The goal of our study was to explore the extent to which macroinvertebrate community composition changes over the course of the summer within a single watershed. To address this question, we sampled macroinvertebrates within three stream reaches within the Tatnuck Brook Watershed in Worcester County in both June and August of 2022. We used a Surber sampler to collect at least 200 organisms from three replicate sites per reach per month, and identified specimens to the lowest possible taxonomic level in the lab. We expect to find a significant change in macroinvertebrate community composition across the summer months. Determining the extent to which the abundance and diversity of macroinvertebrates varies across the summer months will be helpful for guiding the design of future biomonitoring efforts in this watershed.

Annotation and Comparative Analysis of Insulin-like Peptides and Their Interacting Genes across *Drosophila* Species

Logan T. Cohen

Faculty Advisor: Daron Barnard, Ph.D.

Oral Presentation

Insulin-like peptides (ILP) are important endocrine products that act as neurotransmitters, growth hormones, and signaling molecules. In *Drosophila*, the coding regions of ILP genes vary significantly across species despite their conserved function. The genes which interact with ILPs also demonstrate remarkable change while still maintaining their function, suggesting a subset of the insulin signaling network with the capacity for profound genetic adaptability. The function of ILPs is well conserved between *Drosophila* and the rest of the animal kingdom, and a better understanding of ILPs and their gene interactions through annotation and comparative genomic analysis across species of *Drosophila* may improve our understanding of metabolism, sleep, development, and lifespan in other animals, including humans.

Body-Scaled Affordances and Gap-Crossing Strategies

Sarah M. Doyle

Faculty Advisor: Luis Rosado, Ph.D.

Funding Source: Aisiku Interdisciplinary STEM Research Team Initiative

Commonwealth Honors Project

Poster Presentation — Traditional

From an ecological perspective, human visual perception processes continuous information about actions the environment affords. Environmental affordances are size-scaled to navigate our environment safely. Walking through openings is an everyday body-scaled task requiring continuous visual information. Successful passage through a gap such as a doorway can be accomplished straight-on, but individuals can adopt a sideways strategy based on relative body size to opening width. As openings narrow, when is a sideways strategy necessary, and is this perceived as a body-scaled affordance? Participants passed through openings of 120 percent, 100 percent, 80 percent, and 60 percent of their shoulder width. We expect that as gap narrows, time to complete the passage will increase and that a sideways strategy will be adopted more frequently at a width of 80 percent or less.

Virtual Reality Immersion Measured through Heart Rate Responses to Visual Cliffs

Brooke Gagne; Maureen Grady

Faculty Advisor: Luis Rosado, Ph.D.*Funding Source:* Worcester State Foundation Student Research, Scholarship, and Creative Activity Grant

Poster Presentation — Traditional

The human perceptive mechanism emerges as individuals develop and interact with the environment, thereby inextricably coupling action with perception. Virtual reality (VR) environments allow manipulation of visual perception to explore action-perception coupling, but only while individuals remain immersed. Immersion is how encompassing or realistic VR is to a person interacting with it. We hypothesized that increased heart rate (HR) responses to simulated visual cliffs indicate VR immersion and HR would increase with increasing depth of the visual cliffs. HR increased between sitting and standing baseline ($p < 0.05$), between standing baseline and all visual cliff depths ($p < 0.05$), and between shallow and medium depth ($p = 0.03$), indicating some immersion is lost between medium and maximum depths in our VR simulations.

Identification, Expression, and Characterization of Nematicidal *Bacillus thuringiensis* Cry Proteins

Adam G. Helfenbein

Faculty Advisor: Yan Hu, Ph.D.*Funding Source:* Aisiku Fellowship

Poster Presentation — Traditional

Soil-transmitted helminths, such as hookworms, affect an estimated 1.5 billion individuals worldwide. To treat these infections in endemic countries, two classes of anthelmintic drugs are used for mass drug administration, but drug resistances for these treatments are emerging. The soil bacterium *Bacillus thuringiensis* (Bt) produces Cry proteins that show efficacy against helminth infections. To identify novel anthelmintic Cry proteins, 847 soil samples were isolated, and nine strains of *Bacillus thuringiensis* with identifiable Cry proteins were obtained. These novel Cry proteins were harvested in a spore crystal lysate (SCL). Assays with the SCLs were run against the model organism *C. elegans*, and the hookworm *Necator americanus*, under standard conditions. This study showed promising potential bioactivity of certain novel Cry proteins against *C. elegans* and *Necator*.

Analysis of Macroinvertebrate Assemblages throughout the Urbanization Gradient of the Tatnuck Brook of Central Massachusetts

Stephen Humphrey; Kari Mickunas; Caitlin Dellert; Alyssa Hammond

Faculty Advisor: Diana Sharpe, Ph.D.*Funding Source:* Worcester State Foundation Student Research, Scholarship, and Creative Activity Grant; Aisiku Interdisciplinary Team Grant

Poster Presentation — Traditional

Urbanization is associated with a plethora of consequences for aquatic environments. Assessing their ecological repercussions may be done by analyzing variations in macroinvertebrate assemblages in urban watersheds. This study examines how lotic macroinvertebrate assemblages in the Tatnuck Brook watershed of Central Massachusetts may vary with urban land cover. Macroinvertebrate communities were sampled using a Surber sampler twice during the summer of 2022 in three different locations in the watershed. Subsampling was utilized for the sorting and identification of specimens. Spatial land use data will be used to test for a correlation between percent urban land use and various indices of biotic integrity. These findings will shed light on the extent of the relationship between ecological impairment and urbanization in the Tatnuck Brook Watershed.

A DNA Barcoding Survey of the Distribution of Three Cattails Species (*Typha latifolia*, *Typha angustifolia*, *Typha x glauca*) in the Worcester State University Vicinity

Amanda M. Lo; Saniya Sayed

Faculty Advisor: Aleel Grennan, Ph.D.

Poster Presentation — Traditional

The broad-leaf cattail, *Typha latifolia*, is a North American plant species that inhabits shallow water bodies. In recent years, invasive species *Typha angustifolia* and hybrid species *Typha x glauca* were found in the native habitat of the *Typha latifolia*. The invasive species have the ability to drive out the native species from their habitats. The hybrid species is difficult to distinguish from the native species due to its wide range of leaf sizes. The aim of this study is to determine the distribution of these cattail species in bodies of water near WSU. To do so, DNA was isolated from cattail samples from areas surrounding WSU, and DNA barcoding of the *rbcL* and *matK* genes will be used to differentiate the three cattail species accurately.

Correlating Immersive Tendencies with Overall Immersion as a Measure of the Immersiveness of VR Simulations

Andres Ovalles; Petr Saif; Martha Boiquaye

Faculty Advisor: Luis Rosado, Ph.D.

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

Poster Presentation — Traditional

Virtual reality (VR) is a useful tool when exploring human visual perception if the VR simulations are visually immersive. Additionally, some individuals are more inclined to immersion than others. Immersion is how encompassing or realistic VR is to a person interacting with it. Therefore, a person's immersive tendency (IT) should correlate positively with overall immersion (OI) in VR that is indeed immersive. We correlated participants' IT and OI in three VR iterations of our lab room. The IT questionnaire questions positively correlated most often ($r \geq .4 = 8$) with OI questionnaire questions in Room #2 and least often ($r \geq .4 = 4$) in Room #1 while Room #3 negatively correlated most often ($r \leq -.4 = 3$).

How Does the Abundance of Non-insect Macroinvertebrates Vary along an Urbanization Gradient?

Katie Steeves; Kari Mickunas ; Caitlin Dellert; Alyssa Hammond

Faculty Advisor: Diana Sharpe, Ph.D.

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

Poster Presentation — Traditional

Urbanization is a major driver of water quality in streams, and can strongly influence the abundance of freshwater organisms, including invertebrates. The objective of this study was to quantify how the abundance of non-insect macroinvertebrates varied along an urbanization gradient within the Tatnuck Brook watershed. To do this we quantitatively sampled macroinvertebrates using a Surber sampler at different locations throughout the watershed during the summer of 2022. We then identified and enumerated non-insect macroinvertebrates under the microscope. We expect to see a greater relative abundance of tolerant groups of non-insect macroinvertebrates (e.g., amphipods, aquatic worms, leeches) and a lower abundance of more sensitive taxa (e.g., crayfish, limpets) with increasing levels of urbanization.

How Does the Abundance and Diversity of *Trichoptera* in Streams Vary along an Urbanization Gradient?

Zachary C. Trudell; Kari Mickunas; Caitlin Dellert; Alyssa Hammond

Faculty Advisor: Diana Sharpe, Ph.D.

Funding Source: Worcester State Foundation Student Research, Scholarship, and Creative Activity Grant; Aisiku Interdisciplinary Team Grant

Poster Presentation — Traditional

Freshwater environments are home to diverse communities of macroinvertebrates, but are increasingly threatened by anthropogenic stressors like urbanization. This study quantified the diversity and abundance of *Trichoptera* (caddisflies) in the Tatnuck Brook watershed located in Worcester, Mass., to learn how they vary along an urbanization gradient. *Trichoptera* are an important order to study because they are abundant in North America and are sensitive to pollution. During the summer of 2022, streams were sampled in three locations along the Tatnuck Brook. These samples were then sorted and the macroinvertebrates identified to family. We expect to observe a negative correlation in abundance and diversity of *Trichoptera* and the degree of urbanization across the brook. Understanding how freshwater ecosystems are impacted by urbanization is crucial for conserving freshwater biodiversity.

BIOLOGY and CHEMISTRY

The Development of Novel Antimicrobial Agents Using Imines

Stephanie McGinnis; Elvis Njoki; Olivia Wright

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

Poster Presentation — Traditional

Imines were synthesized in high yield from amines and aldehydes using microwave irradiation and a “solvent-free” system. Microwave synthesis is considered to be an effective and environmentally friendly system. All imines have been characterized by UV-visible spectrophotometry, infrared spectroscopy, proton nuclear magnetic resonance, and melting point. Imines have known antibacterial and antifungal properties. These complexes have been evaluated against various bacteria and have demonstrated antibacterial activity. Bacteria tested include *Staphylococcus aureus*, *Enterococcus faecalis*, and *Escherichia coli*.

BIOTECHNOLOGY

Is the Production of Leaf Volatile Organic Carbons Influenced by Leaf Microbiome Profile?

Adam J. Briand

Commonwealth Honors Project

Graduate project

Faculty Advisors: Aleel Grennan, Ph.D.; Kathleen Murphy, Ph.D.

Funding Source: Aisiku Interdisciplinary Research Grant

Poster Presentation — Traditional

Volatile organic carbons (VOCs) are important signaling molecules emitted by plants that provide a number of purposes: communication between species, attraction of pollinators, and repellence of predators. Although VOCs are produced by the plant, studies have demonstrated that microbes associated with the plant can alter VOC production. Our hypothesis (if two leaves of the same species produced different VOCs, then their microbiomes must be different) seeks to test this using a common garden approach. *Mitchella repens* were collected from two separate locations and placed in identical growth conditions. Preliminary results indicate that despite growing under similar conditions, the VOC signals and culturable microbes from each plant were different. This suggests that the leaf’s microbiome plays a role in adjusting VOC emission.

Development of a Library of Antibacterial Agents Using Imines and Zinc Coordinated Imines

Eric Merriam; Aman Johnson; Sean Gavin

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

Poster Presentation — Traditional

Imines have known antibacterial and antifungal properties, which are amplified when chelated with metals. In order to create a library of complexes to study, various imine ligands of increasing complexity have been synthesized and coordinated with Zn(II). The imines were synthesized using a green “solvent-free” method in the microwave. The full characterization of the imine ligands as well as their metal complexes are shown. These compounds have demonstrated antibacterial activity. Bacteria tested include Gram-positive *Staphylococcus aureus* and *Enterococcus faecalis*, and Gram-negative *Escherichia coli*.

Mitchella repens : Analysis of Alpha-Pinene and D-Limonene Peak Areas Using Gas Chromatography

Casey E. Mullaly; Adam J. Briand; Amanda M. Lo; Saniya Sayed

Faculty Advisors: Kathleen Murphy, Ph.D.; Aleel Grennan, Ph.D.

Funding Source: WSU Summer Undergraduate Research Grant

Poster Presentation — Traditional

Mitchella repens, commonly known as partridgeberry, is a woodland species found in mats on the forest floor. There are two floral morphs: pin and thrum. The wild-type species has two flowers, each with four petals, connected by a shared ovary. Successful pollination requires pollinators to transfer pollen from one morph to the other. Peak areas of volatile organic compounds (VOC) vary depending on the age of the flowers. This study focused on the VOCs alpha-pinene and d-limonene, aiming to investigate whether there is a correlation between VOCs and pollinator attraction. Data analysis using gas chromatography and computer applications indicated that VOC peak areas decreased as the flowers aged. The findings highlight the significance of VOCs in pollinator attraction and the successful reproduction of this species.

BUSINESS ADMINISTRATION

Online Therapy: Is Digital Therapy More Appealing Than Face-to-Face Talk Therapy Since COVID-19 for Digital Natives?

Elias F. Nelson; Kyra N. Prouty

Faculty Advisor: Lagnajita Chatterjee, Ph.D.

Poster Presentation — Electronic

In recent years, everyone was affected by the COVID-19 pandemic. Society went into lockdown, and people were left to their own devices. With everyone being shut in for extended periods of time, people were much less likely to access mental health services like therapy and counseling. This situation led to a shift in the way we look at therapy tools, with people turning to options available online. We are now in a post-COVID-19 world, where things are almost back to normal. However, these online options have stayed relevant, so the question stands: why do digital therapy tools still remain relevant with many health care services back in person? We explore why digital tools like virtual therapy and counseling are still relevant as life has returned mostly to normal.

CHEMISTRY

Cultivating Student Research Interests in a Research-esque Discovery Style Undergraduate Organic Chemistry Laboratory Course

Sydney V. Demers; Joshua A. Fung-A-Fat

Faculty Advisors: Jeremy Andreatta, Ph.D.; Margaret Kerr, Ph.D.; Weichu Xu, Ph.D.

Poster Presentation — Traditional

Undergraduate organic chemistry laboratory courses act as a baseline for introductory scientific experimentation by providing students with the knowledge and skills for their future careers. The traditional lab is conducted by providing a structured protocol of the experiment for the students to follow and reproduce, which is effective at imparting skills, but fails to demonstrate the true nature of scientific experimentation: discovery and problem-solving. We have redesigned the organic chemistry laboratory courses by using “research-esque” discovery-style learning, in which certain experiments are treated as a research project through varying parameters within the experiment. This creates an opportunity to increase the understanding of the experiment at hand, pique the students’ interest in the subject, and create an environment that is similar to scientific research.

Engaging Students in Chemistry Courses through Collaborative Learning

Sydney Demers; Michaela Hippert; Ynhi Nguyen; Bryan Escobar; Ashley Lavoie

Faculty Advisor: Weichu Xu, Ph.D.

Funding Source: WSU Advancement Office Experiential Learning Stipend

Poster Presentation — Traditional

Conventional approaches in chemistry courses have been adjusted to better situate students and professors for facilitating active participation and increasing student purpose within the classroom. There has been an increased use of group-based and independent learning approaches being utilized in the classroom, including discussion boards and small-group assignments. Results from these methods showed a remarkable enhancement in student engagement, communication, and problem-solving skills, and an overall increase in class performance in these chemistry courses.

Synthesis Study of DNA Polymerase III Inhibitors for Antimicrobial-Resistant Bacteria

Sydney V. Demers; Ynhi V. Nguyen

Faculty Advisor: Weichu Xu, Ph.D.

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

Poster Presentation — Traditional

Antimicrobial resistance (AMR) has been an ongoing challenge in the medical field. AMR is caused by bacteria resistance against existing antimicrobial drugs. The development of new antibacterial drugs with novel targets has become one of the major research topics to curb this challenge. Recently, the DNA polymerase III (pol III) inhibitor ibezapolstat has been in a clinical study as an effective antimicrobial drug targeting the AMR Gram-positive bacterium, *Clostridium difficile*. Our research focuses on the synthesis of derivatives of ibezapolstat, such as the target compound above. Synthesis, analyses of new compounds, and the action mechanism will be discussed in this poster.

Increasing Emissions of Room-Temperature Inorganic Nanoparticles

Joshua A. Fung-A-Fat

Faculty Advisor: Weichu Xu, Ph.D.

Commonwealth Honors Project

Poster Presentation — Traditional

A rising emergence of nanotechnology is being used to aid in advancing medical imaging and optical computing. Nanotechnology consists of synthesizing various types of nanoparticles based on properties, size, and components. Within this study KNd2F7 nanorods were synthesized via hydrothermal synthesis and analyzed based on emission properties when charged under high-intensity light and transmission electron microscopy (TEM) imaging to view their overall structure. These nanoparticles are unique due to their property of emitting short, intense bursts of light under room-temperature conditions, which increase in intensity as their size increases. Concentration of surfactant and heating temperature were increased in the preparation of the nanoparticles to increase their overall size and emission strength.

The Interaction between Hydrogen Molecules and Metal Clusters that Affects the Chemisorption of Hydrogen on Carbon Structures

Hong Huynh

Faculty Advisor: Joseph Quattrucci, Ph.D.

Poster Presentation — Traditional

In this project, we use computational techniques to investigate the interaction between hydrogen molecules and metal clusters which are adsorbed to carbon structures. These studies will provide a better understanding of the dissociate chemisorption of hydrogen on graphene. The Vienna Ab initio Simulation Package (VASP) is used to perform electronic structure calculations. VASP is a software package that uses Density Functional Theory (DFT) to solve the quantum problem for materials. This work will contribute to the current knowledge of hydrogen storage on carbon structures.

Synthesis of NNN Manganese Complexes and Potential Catalytic Applications

Hamza A. Khan; Wafic M. Ellakis

Faculty Advisor: Jeremy Andreatta, Ph.D.

Commonwealth Honors Project

Poster Presentation — Traditional

Tridentate pincer ligands have been studied extensively due to a variety of useful properties exhibited by the family of molecules. A subset of these compounds, NNN pincer ligands, is characterized by having a central pyridine ring with two adjacent amine groups on each of the branching arms. Current literature has focused on bis(imino)pyridine and bis(phosphino)pyridine ligands. This work explores the use of bis-aminopyridine manganese complexes for the catalytic upgrading of ethanol to butanol (or other higher-order alcohols) given their potential applications as a better fuel additive versus ethanol during the transition to alternative energy sources, among other potential catalytic applications.

CHEMISTRY AND EARTH, ENVIRONMENT, AND PHYSICS

Determination of Trace Metals in Sediment/Soil Samples

Andrew S. Marini

Faculty Advisor: Meghna Dilip, Ph.D.

Poster Presentation — Traditional

Soil and sediment samples were collected at various locations within the Tatnuck Brook watershed area. Qualitative analysis of metal content in the samples was done using Inductively Coupled Plasma-Optical Emission Spectroscopy (ICP-OES). Lead and other trace metals found in the samples were quantitatively analyzed. The results were correlated with land use change and urban development.

COMMUNICATION SCIENCES AND DISORDERS

Changes in Cognitive Performance with Treatment of Hearing Loss and Tinnitus

Reaghan M. Pottle; Samantha R. Kelleher; Theresa T. Nissenbaun

Faculty Advisor: Keith Darrow, Ph.D.

Poster Presentation — Traditional

In the past decade, hearing health care has focused on the impact of hearing loss on cognitive performance. Several reports from Johns Hopkins indicate 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 potentially preventing dementia. This study aims to understand the impact of treating hearing loss on several cognitive domains, including memory, visuospatial performance, executive function, and processing speed, as measured by Cognivue Thrive. Adult subjects including new and current hearing aid users underwent a cognitive screening pre- and post-treatment at 60 days and 6 months after starting hearing aids. Differences across modalities were compared to observe differences that may result from treating hearing loss.

Best Practices in Hearing Health Care

Jaqueline E. Tallino; Edan A. Caggiano; Julienette J. Rivera

Faculty Advisor: Keith Darrow, Ph.D.

Poster Presentation — Traditional

The treatment of hearing loss may increase cognitive performance and reduce the rates of traumatic falls and dementia in older adults. Unfortunately, best practices for the diagnosis and treatment of hearing loss are not clearly defined across industry organizations that provide education, certification, and licensure to providers. The organizations include the Council of Academic Programs, the American Speech-Language and Hearing Association, the American Academy of Audiology, and the International Hearing Society. The goal of this study was to better understand academic and clinical skills acquired in U.S. doctoral audiology programs. Both academic and clinical faculty were surveyed to assess credit hours and clinical opportunities provided to students for specific diagnostic and treatment procedures.

COMPUTER SCIENCE

Tumor Segmentation and Classification Using Image Processing and Machine Learning

Gaurav Dhital

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

Funding Source: WSU Summer Undergraduate Research Grant

Poster Presentation — Electronic

The aim of this project is to create an effective and efficient solution for analyzing mammography images. By utilizing image processing techniques, the system segments tumors from high-resolution contrast-enhanced spectral mammograms. A range of machine learning algorithms is then used on a diagnostic dataset to determine whether the tumor is benign or malignant. The system's effectiveness was measured using metrics like accuracy, precision, recall, F1 score, and support. The findings suggest that the system is accurate and can effectively differentiate between benign and malignant tumors with accuracy of up to 96.50 percent. With further work and improvement, this project has the potential to aid in early diagnosis for patients with breast tumor.

Heart Data Evaluation: A Societal Health Reflection

Mike Morley

Faculty Advisor: Elena Braynova, Ph.D.

Oral Presentation

Heart failure is one of the most significant factors of societal health issues. Analyzing the factors of a healthy or unhealthy heart is a vital first step for medical biotechnology. Although today's society offers more data than ever before, said data needs to be organized and interpreted properly. Using data cleaning, data visualization, statistical analysis, and machine learning techniques, we show how to organize heart health data properly, and discover trends that create hypotheses/concepts for new medical technology.

EARTH, ENVIRONMENT, AND PHYSICS

Investigating Environmental Equity: Comparing Vegetation and Population Demographics

JungHyo Batino; Alisa Olivia; Elizabeth Stone

Faculty Advisor: Nabin Malakar, Ph.D.

Poster Presentation — Traditional

Vegetation is an indicator of environmental health and can influence the soil, water, temperature, and air quality. The goal of this study was to create and compare maps of vegetation and population demographics in selected cities of Massachusetts. Public online data was compiled, visualized, and compared in MATLAB software. We expect low-income communities and historically marginalized communities to show less vegetation compared to the rest of their region.

Worcester Coal Mine Brook Formation

Alyssa T. Bishop

Faculty Advisor: Laura Reynolds, Ph.D.

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

Poster Presentation — Traditional

The Worcester Coal Mine Brook Formation is a section of bedrock that hosted a short-lived coal mine located off of Plantation Street in Worcester, Mass., in the mid 1800s. While this rock formation and its fossils have been studied for many years, the exact boundaries of the formation and how it is related to other rocks in the area require additional research. In fall 2022, we went out to the Coal Mine Brook area in search of rock outcrops, which we identified and mapped using GPS. We then took strike and dip measurements of the foliation (layering) in these rocks and compared these measurements to other foliation measurements in the region. Then, we collected rock samples from the outcrops and sent them out for thin section analysis, which will indicate how the mineral composition of the rocks varies among outcrops and rock types. We will use the mapping and mineral information to map and describe this interesting formation more precisely.

El Niño and Its Effects on Net Primary Productivity

Gurmitt Dhaliwal; Umutoni Helene; Paul Martino

Faculty Advisor: Nabin Malakar, Ph.D.

Oral Presentations

This study aims to analyze the impact of El Niño on Net Primary Productivity (NPP) in Southeast Asia using MATLAB. El Niño is the warming of the oceans in the Equatorial region that changes the sea surface temperature (SST). Satellite data on NPP from 2000 to 2020 were collected and analyzed to identify the changes in NPP during El Niño events. The analysis was performed using MATLAB's Image Processing Toolbox to process and visualize the satellite data. Results showed that El Niño events led to a significant decrease in NPP in Southeast Asia. The findings from this study can be used to inform policy decisions related to the management and conservation of ecosystems in Southeast Asia, especially during El Niño events.

Streamwater Salinization across a Rural-Urban Gradient in Worcester, Mass.

Alison L. Dunn; Caitlin D. Dellert; Meghna Dilip; Alyssa Bishop; Stephen Humphrey; Kari Mickunas; Andrew Simpson; Zach Trudell

Faculty Advisor: Laura Reynolds, Ph.D.

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

Poster Presentation — Traditional

Streamwater salinization is strongly driven by patterns of land use within watersheds. We examine how land use affects salinity across the urban watershed of the Tatnuck Brook in Worcester, Mass. We have measured specific conductance at several locations influenced by different degrees of urbanization from 2019 to 2023. We hypothesized that downstream (more urban influence) conductance values would be elevated relative to upstream (less urban influence) due to anthropogenic factors — primarily road salt usage. Our results showed that downstream conductance was elevated relative to upstream values. Our preliminary results indicate that it may be possible to pinpoint which geographic areas contribute the most to downstream salinization. Results from this work could provide guidance to municipalities seeking to minimize the downstream impacts of road salt applications.

Quantifying Litter Pollution at Greenbriar Recreation Area, Oxford, Mass.

Nicole A. Feige

Faculty Advisor: Laura Reynolds, Ph.D.

Poster Presentation — Traditional

Litter is a persistent and environmentally degrading issue. To better document this global environmental problem, I will assess trash found at various locations within the Greenbriar Recreation Area in Oxford, Massachusetts. Over the course of three days, I will collect trash from several sites around the recreation area and identify the types of trash, mass, and number of pieces. I expect my results to show that different types of trash will be found in different sites and that some sites will be more polluted than others. I hope to use the results of this project to raise awareness of the impact of litter on the environment.

A Study of the Urban Heat Island Effect on Various U.S. Cities

Grace K. Higgins

Faculty Advisor: Nabin Malakar, Ph.D.

Funding Source: NASA Space Grant Fellowship (2023)

Graduate Project

Poster Presentation — Traditional

An Urban Heat Island (UHI) is a phenomenon that causes temperatures to rise due to the replacement of natural surfaces with dark, impermeable surfaces. The prevalence of such surfaces causes heat to be retained instead of being radiated back into space, resulting in a higher ambient temperature compared to the surrounding environment. The UHI effect is exacerbated by climate change and urbanization, leading to various health, economic, and environmental consequences. In this case study, we will collect air temperature, particulate matter, and humidity data, and use remote sensing to analyze the intersection between environmental impacts and human health. These data, along with satellite remote sensing data, will allow us to investigate the intensity of UHI in various cities across the United States.

Water Quality Urban Gradient

Jaclyn Holovnia; Logan Laflamme; Evgenia Psarras; Klarissa Johnson; Riley Sanderson; Alyssa Bishop

Faculty Advisor: Laura Reynolds, Ph.D.

Funding Source: Worcester State Department of Earth, Environment, and Physics; Aisiku Interdisciplinary Team Grant

Poster Presentation — Traditional

Water quality properties vary between rural and urban areas due to both natural and human influences. Tatnuck Brook, in Worcester, Mass., flows along an urbanization gradient from the rural Holden Reservoirs to the urban Coes Reservoir and is a good site to test for human influence on water quality. Over the spring 2023 semester, we used different YSI water quality probes to collect data on Tatnuck Brook, its tributaries, and the ponds formed by dams along the brook. We measured water temperature, dissolved oxygen, water depth, conductivity (a proxy for salt concentrations), and turbidity. The results show that these parameters vary both geographically and over time; conductivity shows the strongest relationship with urbanization.

Efficacy of Citizen Science in Assessing Avian Migrational Patterns

Stephen E. Humphrey; Emily R. Maynard; Zachary C. Trudell

Faculty Advisor: Nabin Malakar, Ph.D.

Poster Presentation — Traditional

Citizen science is becoming an increasingly utilized tool for assessing aspects of ecologies that may be costly or time-intensive to survey. However, the efficacy of certain types of citizen science is in question. eBird is a program where birdwatchers upload their sightings to a database through a mobile app. In this study, we will compare eBird bird sightings to USGS Bird Banding data to assess the reliability of citizen science in the context of Veery migration, a species with a large migration range from North America to South America. We expect to see that eBird data, when used to assess migrational patterns, will be comparative to USGS Bird Banding data.

Urban Heat Islands of Central and Eastern Massachusetts

Jackson T. Lam; Maxwell M. Bravo; Edward R. Reitz III

Faculty Advisor: Nabin Malakar, Ph.D.

Poster Presentation — Traditional

Urban heat islands (UHI) are cities that are covered with a higher percent of dark impervious surfaces compared to natural land cover, which results in an increased rate of solar absorption warming the surrounding area. UHIs can have both short-term and long-term effects that impact urban citizens, such as increased energy costs and more frequent heat-related injury and illness. The population of urbanized cities across the globe is gradually increasing, and with projected future environmental changes, it is expected that more land cover will be converted into impervious surfaces. Our data collection site ranges from Central to Eastern Massachusetts and our literature review has assessed a continuous warming trend in urbanized areas.

Coastal Fires in Maine

Emily Maynard

Faculty Advisor: Laura Reynolds*Funding Source:* Worcester State Foundation Student Research, Scholarship, and Creative Activity Grant

Poster Presentation — Traditional

In 1947, Maine experienced a fire that burned most of Acadia and areas of Southern Maine. When forest fires occur, charcoal is left behind in the sediment which can be analyzed to determine historic fire frequency. This study will examine two cores from a salt marsh in Wells, Maine. We will test the hypothesis that the 1947 fires left a layer of charcoal that was preserved in coastal marsh sediments. We will further test the hypothesis that charcoal in modern sediments varies randomly and is not related to grain size, which would indicate that a spike in charcoal in a sediment core can be tied to a past fire. Using a known fire event will help us better interpret charcoal records from coastal regions.

Tatnuck Brook Watershed Habitat Assessment

Emily Maynard

Faculty Advisor: William Hansen, Ph.D.*Funding Source:* WSU Summer Undergraduate Research Grant

Oral Presentation

Water quality in lacustrine environments is influenced by watershed characteristics such as land cover, as well as shoreline habitat and structure. The Patch Reservoir watershed drains 2,567 hectares and is fed by its major tributary, Tatnuck Brook, and includes diverse land cover from primarily forested headwaters to high-density urban including the Worcester Airport. This project aimed to complete a land cover assessment of the Tatnuck Brook watershed and its sub-watersheds, which include tributaries to the Tatnuck Brook. Additionally, this project carried out a habitat assessment, based on EPA standards, of both Patch Reservoir and Cooks Pond shorelines as well as stream profiles of seven tributary sites. All sites were selected to match sites used in the larger, Tatnuck Brook Watershed Project so data can be used in both macroinvertebrate survey and water quality analyses.

Particulate Matter 2.5 in the City of Worcester, Mass.

Timothy J. O'Leary; Logan J. Laflamme

Faculty Advisor: Nabin Malakar, Ph.D.

Poster Presentation — Traditional

Particulate Matter 2.5 (PM 2.5) is an irritant that poses a threat to many vulnerable groups like the elderly, children, and those with pre-existing heart and lung conditions. Local pre-existing and ongoing data collected by the EPA, as well as field data, will shed light on concentrations of PM 2.5 in various neighborhoods around the city of Worcester, Mass. Measuring PM 2.5 in the Worcester communities will provide concentration levels that indicate which neighborhoods are most at risk. Using EPA records will provide past PM 2.5 concentrations of Worcester over the course of a few decades. With these data, we can examine trends over time and draw conclusions regarding the future health of the people of Worcester.

Spectral Imaging of Shocked Regions in HH114

Cameron M. Prosser

Faculty Advisor: Andrew Burkhardt, Ph.D.

Oral Presentation

In the interstellar medium, chemically active protostellar outflows shock surrounding clouds, allowing for complex organic molecules (COM) to form. While these types of outflows are relatively rare, they uniquely allow COMs to sublime directly from the icy surface of dust. In unshocked regions, the gas-phase abundance of these COMs is too sparse to observe with current technology. Here, we image the recently discovered chemically active outflow HH114 through radio interferometric spectra using the Submillimeter Array (SMA). We identify the presence of shock tracer molecules (e.g., SiO, CH₃OH) which indicate more complex chemistry is occurring in these regions. Based on the abundance and location of these molecules, we can infer the outflow trajectory and its interactions with COMs surrounding the protostar.

Odor Mitigation Strategies at Cannabis Facilities

Evgenia Psarras

Faculty Advisor: Laura Reynolds, Ph.D.

Funding Source: MassDEP

Poster Presentation — Traditional

As cannabis cultivation and extraction facilities emerge throughout Massachusetts, the Massachusetts Department of Environmental Protection Bureau of Air and Waste is tasked with ensuring that these facilities are not causing odor-related air pollution. Because cannabis production is a new industry in Massachusetts, additional research on best practices for odor mitigation is needed. As part of my internship with MassDEP, I am conducting a semi-systematic literature review on the causes of odors, current and proposed odor mitigation practices, and potential negative environmental impacts of these practices. My preliminary results indicate that a variety of techniques is currently used within Massachusetts and in other states, including bio, mineral, and carbon filters; ozone generators; and chemical additives. Further research will identify best practices and their efficacy.

Charcoal Deposits in Coastal Regions of New Hampshire, Maine, and Massachusetts

Riley Sanderson

Faculty Advisor: Laura Reynolds, Ph.D.

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

Poster Presentation — Traditional

Maine experienced large wildfires throughout much of the state in 1947, including the city of Biddeford. To determine how well evidence of past fires is preserved in marshlands, I tested for charcoal in a sediment core from a marsh located in an area burned in 1947. I sampled 1cc of sediment from each cm depth of the core. These samples are then soaked in hydrogen peroxide to bleach the unburned plant matter so the charcoal was identifiable. We expect to find a large peak in charcoal in the top 50 cm of sediment related to the 1947 fire, as it was the largest recorded fire in this area.

The Anthropocene History of an Urban Lake

Kari Mickunas

Faculty Advisor: Laura Reynolds, Ph.D.

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

Poster Presentation — Traditional

Reservoirs provide habitats for organisms, drinking water, and recreation space. Reservoirs are impacted by a variety of human and natural changes, which are recorded in their sediments. Patch Reservoir, in Worcester, Mass., was created in the late 1800s and is an important local water body, but has experienced significant challenges recently due to sediment infilling. We compare results from sediment core analysis to historical information compiled from a variety of sources, including historic newspaper clippings and aerial photographs, to show that flooding and watershed construction in the mid 1900s and beaver dam construction in the early 2000s are correlated with changes in sedimentation in the lake.

California Wildfire Intensity from 2000 to 2020

Harley L. Westgate; Shelby F. Brooks

Faculty Advisor: Nabin Malakar, Ph.D.

Poster Presentation — Electronic

According to the World Health Organization (WHO), wildfires are often caused by human activities or natural phenomena, and wildfires can happen anywhere there is material to burn with a trigger. Our research shows the distribution of wildfires in California over the last 20 years in intervals of 5 years. It further describes the impacts wildfires have on humans, the environment, and the ecosystem, while emphasizing how they are contributing to climate change. A survey of data from the Application for Extracting and Exploring Analysis Ready Samples (AppEEARS), California Department of Forestry and Fire Protection CAL FIRE), and NASA Firer Information for Resource Management System (FIRMS) suggest that we will find a seasonal correlation in addition to more wildfires overall in future years due to climate change, as well as a gradual increase in the intensity and severity of these fires.

Searching for a Benzene Proxy throughout the Earliest Stages of Star Formation

Brayden J. Wilcomb

Faculty Advisor: Andrew Burkhardt, Ph.D.

Oral Presentation

Benzonitrile (C_6H_5CN), a polar proxy for benzene (C_6H_6), has the potential to serve as a highly convenient radio probe for aromatic chemistry in the interstellar medium. Therefore, it is important to search for this compound across astronomical sources beyond the molecule-rich pre-stellar cloud Taurus Molecular Cloud (TMC-1) where it was first reported. Building upon the initial detections in four sources, I present radio astronomical data from the ARKHAM observational survey, searching for evidence of benzonitrile in the Serpens cloud and beyond to establish how common aromaticity is in sources outside of TMC-1. Additionally, I determine the abundance of benzonitrile in the earliest stages of star formation in order to constrain how and where aromatic molecules are formed.

ENGLISH**Brain Coup**

Karen P. Higgins

Faculty Advisor: Riley McGuire, Ph.D.

Oral Presentation

I am an ally of the LGBTQ community, and have raised a gay son. In delving into narratives to deepen my understanding of the unique experiences of those under the LGBTQ umbrella, I learned of how some antiquated notions still exist in many corners of the world. In my research, I discovered that conversion therapy — a hugely controversial and immensely ineffective chemical alteration of gay, lesbian, and transgender folk — is still a legal option in so-called progressive countries such as the United States and the United Kingdom. My paper presents a closer look at conversion therapy.

Cherry Stones and Jagged Carboard

Karen P. Higgins

Faculty Advisor: Elizabeth Bidinger, Ph.D.

Graduate Project

Oral Presentation

Memoir writing is a deeply personal but cathartic endeavor. It encapsulates a desire to present an authentic, significant story— one that will engage a reader and infiltrate his or her thoughts. In this presentation, I hone in on an important event in my life — one for which I still bear physical and emotional scars — to process that event through my writing, and expand upon my life events of the time, including reflection. “Cherry Stones and Jagged Cardboard” explores a life-changing car accident, at the age of seven, and the resulting realization of the poverty, and thwarted opportunities, into which I had been born.

HEALTH SCIENCES

The Impact of COVID-19 on the Lives of Teens in Worcester

Claudia Oliveira De Paiva

Faculty Advisor: Andrew Piazza, Ph.D.

Funding Source: Amplifying Youth Voices

Poster Presentation — Traditional

The COVID-19 pandemic has affected the world in many ways. As calls grow to shift public health efforts from eradication to living with COVID-19, many communities are now easing COVID-19-related restrictions. Some evidence suggests negative quantitative outcomes among students affected by school closures or remote learning. Given the nascence of our emergence from some COVID-19 restrictions, little qualitative data is known about the challenges students in Worcester, Mass., have faced and will continue to face. The Latino Education Institute (LEI) collaborated with the Health Sciences Department at Worcester State University with support from the Amplifying Youth Voices grant. Information from focus groups with Worcester youth conducted to explore the challenges they face after two years of living with the COVID-19 pandemic will be discussed in this presentation.

School-Based Dietary Interventions: A Systematic Review

Eliana H. Singer; Ashley Goncalves

Faculty Advisor: Elinor Fondell, Ph.D.

Oral Presentation

From 2017 to 2020, 14.7 million children in the United States were affected by obesity, equal to 19.7 percent, or 1 in 5 children in the country. Therefore, children's nutritional status and wellness are a more significant concern now than ever. This systematic review will cover recent studies that aimed to alter diet and food intake in school-aged children. One of the key findings in the review was that changes in children's nutrition require interventions incorporating multiple components and strategies targeting behavior change. The research shows insufficient evidence in interventions that only included nutrition education, while multi-component studies found substantial data on children's nutrition change. Improving children's diet requires an interdisciplinary approach targeting changes from all angles of the child's life.

HISTORY AND POLITICAL SCIENCE

The Ghost Dance and the Wounded Knee Massacre: Was U.S. 19th-Century Domestic Policy the Culprit?

Caitlyn M. Ferrecchia

Faculty Advisor: Joshua Koenig, Ph.D.

Commonwealth Honors Project

Oral Presentation

This research explores how 19th-century domestic policy served as a catalyst for the performance of the Ghost Dance, which led to the Wounded Knee Massacre in 1890. Major legislation passed during the 19th century was detrimental to Native American ways of life, as it implemented oppressive regulations within Native communities, resulting in the dwindling of food supplies and natural resources, extensive loss of life, and the destruction of Native culture and land, driving Native people to desperation. Native responses to these depredations marked the utilization of the Ghost Dance as a religious practice, which served as a catalyst for the Wounded Knee Massacre, as American troops closed in on a Ghost Dance ceremony, mistakenly afraid that the ceremony would lead to an armed rebellion. Research for this project also explores themes surrounding public memory and commemoration as well as historiography, thereby placing Native peoples at the forefront of modern discourse.

INTERDISCIPLINARY STUDIES

International Students' Post-Graduation Immigration Choice

Aspen Zheng

Faculty Advisor: Carl Herrin

Oral Presentation

Most F-1 international students are seeking a higher educational degree, but the process to obtain a job post-graduation is long, competitive, and difficult. It discourages international graduates from working in the U.S. and adds stress to their job-seeking process. Research has shown that the U.S. has labor shortages. If more international students are given the opportunity to work in the U.S. post-graduation, it would help to address those shortages. Permanent residency allows foreigners to enjoy many benefits, as citizens do, including the freedom to live and work in the States. Granting international students permanent residency would benefit the students and better serve U.S. interests.

LIBERAL STUDIES

Mitigating Summer Learning Loss through Motivation

Ronald A. Burgess Jr.

Faculty Advisor: Henry Theriault, Ph.D.

Poster Presentation — Electronic

The Ronald A. Burgess Jr. Foundation, Inc., is a youth development nonprofit. The organization provides multidisciplinary empowerment workshops and mentoring programs for at-risk teens struggling with self-confidence and resiliency and fosters academic success through motivation, story-telling, mentorship, tutoring, and other self-discipline and self-motivation driven initiatives. It aims to help teens residing in low-income communities mitigate learning loss while learning how to overcome common teen challenges. Through our motivationally driven initiatives, workshops, and programs, the Foundation has managed to impact more than 3 million youth and teens all over the world. Today, efforts to mitigate summer learning loss seem to only focus on the primary subjects of education, while neglecting motivationally driven school initiatives as a prerequisite and foundation to closing the gap to summer learning loss.

Including Youth of All Abilities

Allyson G. Graves

Faculty Advisor: Aldo García Guevara, Ph.D.

Poster Presentation — Electronic

Participation through sports has been a proven method of engagement and inclusion for youth with and without intellectual disabilities (IDD) for more than 55 years within the nonprofit organization of Special Olympics. By developing the youth's ability to lead inclusively, engage whole communities, and play effectively with peers, they become well-rounded athletes both on and off the field. Driven by success through teamwork and the development of both themselves and their peers, inclusion and acceptance become second nature for today's adolescents. Throughout Rhode Island, Special Olympics works to promote the three components of Unified Champion Schools, a program introduced 15 years ago to promote inclusive youth leadership, whole school engagement, and unified sports, all while creating intentional time integrated into the school day, for youth with and without IDD to form caring and respectful relationships. This presentation's goal is to highlight the ability of inclusive youth with and without IDD when given the opportunity to participate in meaningful experiences of acceptance and their ability to lead, play, and curate healthy relationships.

MATHEMATICS

Number Theory Applications

Elaine Bond

Faculty Advisor: Michael Winders, Ph.D.

Poster Presentation — Traditional

In the past, Number Theory was thought to be one of the most "pure" forms of mathematics in the sense that it had no applications. Yet, with the advent of high-powered computers, Number Theory is currently one of the most applied branches of mathematics. In this project, we use techniques from Number Theory to investigate one such application, RSA (Rivest–Shamir–Adleman) encryption, which is used to communicate information in a secure manner.

Best Method for Solving Fermi Problems: Groups vs. Individuals

Natalie E. Demers

Faculty Advisor: Maria Fung, Ph.D.

Commonwealth Honors Project

Poster Presentation — Traditional

It has been suggested that Fermi problems — real-world math problems with no numbers given — could be worked on by groups rather than single individuals. At the same time, this suggestion has not been tested. This study examined why it was better to work on these problems in groups as opposed to the usual individual approach. The study divided an entire public school 11th grade in two, where half of the students worked in groups and the others worked individually on the same problem. Examination of the work done indicated that there is value in both individual and group work on Fermi problems.

RSA Encryption: Why It's Safe and When It Breaks

Nathan W. Poch

Faculty Advisor: Michael Winders, Ph.D.

Poster Presentation — Traditional

My project will explain what Rivest–Shamir–Adleman (RSA) encryption is, how it works, why it is secure, and when it is used. I will provide a simple and understandable example of RSA encryption in action and explain why it is typically used in tandem with other encryption methods, such as symmetric-key encryption. Finally, I will provide an example of a system which could theoretically make RSA encryption insecure and explain why, if properly implemented, it would allow one to decrypt anything encrypted with the RSA method.

NURSING

Staffing Shortages and Retention: The Next Threat to Nursing

Kimberly-Ann V. Lang

Faculty Advisor: William Chadbourne

Commonwealth Honors Project

Poster Presentation — Electronic

Staffing shortages and retention have been two of the biggest problems nursing managers face after the COVID-19 pandemic. Due to these shortages, patient satisfaction as well as nursing satisfaction have been declining. In this literature review, the causes for nurses to leave the bedside and the field as a whole are examined. Possible solutions to prevent staffing shortages and improve retention in the nursing field are provided.

Worcester, Tuberculosis Case Management Process of New Refugees with Active Disease

Alysia Tashjian

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

Graduate Project

Poster Presentation — Traditional

Tuberculosis (TB) is currently the second leading global infectious disease killer after COVID-19, according to the World Health Organization. Refugees coming to the United States from higher (TB) risk countries or meeting certain health criteria undergo an Overseas Medical Evaluation per the United States Center for Disease Control requirements. The Massachusetts Department of Public Health is informed of new arrivals and then notifies Local Boards of Health (LBOH) and their local partners involved in TB case management. Worcester, Mass., is part of a coalition of four municipalities with the City of Worcester as the lead agency. This study describes the Worcester LBOH public health nursing process for arrivals needing TB case management identified by the overseas medical evaluation as having active TB, (pulmonary or extra-pulmonary).

Creating a Hoarding Task Force

Debra Vescera

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

Graduate Project

Poster Presentation — Traditional

The prevalence of Hoarding Disorder (HD) continues to be on the rise and is a serious public health concern in communities throughout Massachusetts. HD is estimated to affect 2-6 percent of the population, creating hazardous conditions for people suffering from the disorder and their communities. Research is minimal regarding the efficacy of specific interventions, but some methodologies have demonstrated positive outcomes. Many communities throughout the United States have established hoarding task forces. Recent evidence-based studies have shown that community engagement not only produces opportunities for a multidisciplinary approach but also leads to a sense of connection, leads to better outcomes for hoarding in communities, and improves success for recovery and a better quality of life.

Effects of Continuous Glucose Monitoring and Insulin Pumping for Adolescents with Type 1 Diabetes and Psychiatric Disorders

Hailey F. White

Faculty Advisor: Julia McNeil, Ph.D.

Poster Presentation — Traditional

A literature review was conducted using the Worcester State library databases to determine the effect of new diabetes technology on adolescents with Type 1 diabetes and psychiatric disorders. Specifically, the effect of the new technology on quality of life for those patients was examined. Nurses are required to understand all forms of diabetes management to care for their patients. The literature review focused on implications and significance to nursing, revealing that education, team approach to care, and assessment are of most importance for the population being studied. The research showed that insulin pumps and continuous glucose monitors can improve quality of life for adolescents with Type 1 diabetes and psychiatric disorders.

OCCUPATIONAL THERAPY

Identifying the Role of Occupational Therapists in Dementia Care

Christine A. Babbitt

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

Graduate Project

Poster Presentation — Traditional

A diagnosis of Alzheimer's dementia (AD) can negatively impact the health and quality of life of an older adult. Occupational therapists (OT) can help older adults living with AD. The purpose of this study was to identify the occupational therapy role in the treatment of dementia within the United States. This qualitative study consisted of five semi-structured interviews. This study revealed that OTs have a role in the treatment of AD. Participants identified improved function through client-centered approaches and education as the main areas of treatment focus. Furthermore, findings show that the phase of dementia is not a deterrent to occupational therapy services. The findings of this study indicate that OTs can and do effectively treat clients diagnosed with AD and related dementias.

The Effects of Online Support Groups on Perceived Self-Confidence by Stroke Survivors

Rebecca A. Carrillo

Faculty Advisor: Joanne Gallagher Worthley, Ed.D.

Graduate Project

Poster Presentation — Traditional

Stroke survivors face many unique challenges post-stroke, including a lack of confidence and social support. This study examined the effects that online support groups for stroke survivors have on different aspects of group members' perceived self-confidence. Answers from an online quantitative survey showed that stroke survivors benefit from being in online support groups by experiencing increased comfortability with their status as stroke survivors, motivation to participate in activities meaningful to them, and gaining confidence in explaining their stroke to non-stroke survivors.

The Impact of Sleep on Functioning of College Students

Sophia M. Corrente

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

Graduate Project

Poster Presentation — Traditional

Sleep is an essential part of every person's daily routine. For college students, a lack of sleep can lead to problems with health, mood, behavior, and performance. This study aimed to explore how the sleep habits of college students affect their daily performance patterns and quality through an interview about beliefs and attitudes relating to sleep, perception of daily performance, and nighttime routines. Findings from this study indicate that college students acknowledge that sleep is an important part of everyday life that is necessary to success.

Comparing Factors of Stress among Mothers with and without Children with Autism Spectrum Disorder

Sarah Ellen Deslauriers

Faculty Advisor: Joanne Gallagher Worthley, Ed.D.

Graduate Project

Poster Presentation — Traditional

Parents of children with Autism Spectrum Disorder (ASD) experience higher levels of stress than parents of neurotypical children; however, there is limited research on the exact factors that contribute to the stress in a parent's life. Using interviews, this study aimed to understand and compare the daily experiences of mothers who have children with and without ASD. The study found that mothers of children with and without ASD experience similar factors of stress such as constant cleaning and their child's behaviors affecting mealtime. The study found that mothers of children with ASD also experience challenges with finding childcare and constantly adapting plans to fit their child's needs.

Effects of Having a Child with Type 1 Diabetes on Parents' Quality of Life

Victoria G. Donahue

Faculty Advisor: Joanne Gallagher Worthley, Ed.D.

Graduate Project

Poster Presentation — Electronic

The purpose of this study was to determine the effects of having a child with Type 1 diabetes (T1D) on parents' quality of life (QoL). The goal was to see how parents' habits, roles, and routines were affected, what aspect of a T1D diagnosis impacted mental health the most, and ultimately how parents' overall QoL was affected. In this qualitative study, seven parents with children with T1D participated in semi-structured interviews about how their child's diagnosis had affected their lives. The results of this study showed that having a child with T1D led to parents experiencing performance pattern disruptions, an increase in anxiety, a negative impact on finances, and an overall negative impact on QoL.

Examining the Relationship between Stigma and Physical Disability through Lived Experiences

Aphia M. Donoghue

Faculty Advisor: Joanne Gallagher Worthley, Ed.D.

Graduate Project

Poster Presentation — Electronic

It is important to understand the ways in which stigma, judgment, and discrimination can contribute to or inhibit health, participation, and quality of life for those living with physical disabilities. Through a qualitative design that used semi-structured interviews to collect data, this study examined the relationship between stigma and physical disability, and aimed to discover the impact that stigma has on overall health and well-being. The results revealed that stigma has the ability to negatively impact health, well-being, and overall participation in life of individuals with physical disabilities.

The Effect of LGBTQIA+ Identity on Educational, Work, and Social Occupations

Arianna Giasson

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

Graduate Project

Poster Presentation — Traditional

Lesbian, gay, bisexual, transgender, queer/questioning, intersex, asexual, plus other sexual and gender minority (LGBTQIA+) individuals continue to face discrimination in many contexts due to their identity. This study explored the influence of college students' LGBTQIA+ identity on social, work, and educational occupations. Results indicated that the students surveyed did experience more difficulty than non-LGBTQIA+ peers in these areas, specifically in making friends, feeling comfortable expressing their identity, and overall satisfaction.

Benefits of Nature-Based Interventions on Children’s Development from the Caregivers’ Perspectives

Leah M. Kurr

Faculty Advisor: Joanne Gallagher Worthley, Ed.D.

Graduate Project

Poster Presentation — Electronic

This qualitative study aimed to determine the benefits of nature-based interventions (NBIs) on children’s physical, cognitive, and social development, as well as the development of senses, based on caregivers’ perspectives. Six caregivers who have or have had children in forest schools or nature-based programs participated in semi-structured interviews. It was found that NBIs resulted in improvements in the main themes relating to external developments and internal developments. The findings suggest that occupational therapists could increase the incorporation of NBIs into practice for this population to improve their overall lifestyle.

The Impact of Driving Cessation on Quality of Life in Older Adults

Megan L. Lane

Faculty Advisor: Joanne Gallagher Worthley, Ed.D.

Graduate Project

Poster Presentation — Traditional

The purpose of this qualitative study was to determine the impact giving up driving has on the quality of life of adults aged 65 years old or older. Six participants were recruited for this study and each of them completed a semi-structured interview to address their social relationships and engagement, motivation, and emotional well-being following driving cessation. The themes identified were planning ahead, support network, utilization of time, and acceptance and coping. Additionally, utilization of resources was identified as a subtheme within support network. For each of the three areas observed, both positive and negative effects were noted. The findings suggest that driving cessation is a significant transition for older adults and one that is unique to each individual.

How Emerging Adults Ages 18-25 Are Living with Attention-Deficit Hyperactivity Disorder

Morgan E. Leger

Faculty Advisor: Joanne Gallagher Worthley, Ed.D.

Graduate Project

Poster Presentation — Traditional

Attention-Deficit Hyperactivity Disorder (ADHD) symptoms present with functional challenges that can significantly affect quality of life and occupational outcome. This study employed a qualitative approach to better understand the lived experience of emerging adults with ADHD. Data was collected via semi-structured interviews with six participants between the ages of 18 and 25 diagnosed with the disorder. NVivo data analysis revealed both commonalities and unique differences characterized by broad themes and subthemes, which indicate how ADHD contributes to occupational balance and quality of life, as well as how individuals cope with symptoms when they arise.

The Effect of Crohn’s Disease on Occupational Performance and Engagement

Haley J. Lucier

Faculty Advisor: Joanne Gallagher Worthley, Ed.D.

Graduate Project

Poster Presentation — Electronic

The purpose of this research study was to understand the impact of Crohn’s disease (CD) on an individual’s ability to perform and engage in meaningful activities. In this qualitative study, six individuals participated in semi-structured interviews to determine how their quality of life has been affected both physically and psychologically. The software NVivo was utilized to help organize, analyze, and find themes. Three themes were identified: (1) lifestyle adjustment, (2) negative influence of disease presentation on psychological state, and (3) supports and barriers to a satisfactory life. The results suggest that individuals with CD experience changes in their ability to participate in purposeful activities during a flare-up and a decrease in their quality of life.

The Impact of Upper Extremity Pain on Daily Function and Quality of Life

Kerry K. McGrath

Faculty Advisor: Joanne Gallagher Worthley, Ed.D.

Graduate Project

Poster Presentation — Electronic

This study investigated how different levels of arm pain impacted activities of daily living (ADL), instrumental activities of daily living (IADL), and quality of life (QoL). Six individuals participated in semi-structured interviews that contained 15 questions. The results showed that gross motor skill impairment impacted ADLs, accelerated muscle fatigue impacted the majority of IADLs, and increased stress decreased overall QoL. Heightened arm pain was shown to be related to greater levels of disability. Occupational therapy could help with remediation of these areas through education, adaptations, modifications, and physical modalities.

The Use of Therapeutic Lying in Dementia Care by Nursing Home Employees

Emily A. O'Neil

Faculty Advisor: Joanne Gallagher Worthley, Ed.D.

Graduate Project

Poster Presentation — Electronic

Nursing home professionals who work directly with individuals living with dementia hold a wide variety of perspectives on the use of therapeutic lies, defined as lies told in the best interest of the individual. This study surveyed 30 nursing home employees using a 15-question survey to explore how they define lying to residents with dementia, the factors influencing them to use therapeutic lying, and if there are differences among nursing home professions in their use of therapeutic lying. The findings from this study indicate that nursing home employees who are working directly with residents with dementia are able to define how they use therapeutic lies and in most scenarios find it acceptable to use them.

The Relationship between College Students' Social Media Use, Self-Esteem, and Quality of Life

Ava K. Pinal

Faculty Advisor: Joanne Gallagher Worthley, Ed.D.

Graduate Project

Poster Presentation — Electronic

Current research has shown that prolonged time on social media platforms could negatively impact mental health. The purpose of this study was to explore the relationship between social media use and college students' self-esteem and quality of life. Forty-five college students between the ages of 18-24 completed a 22-question survey regarding social media use, self-esteem, and quality of life. Although participants reported high levels of weekly social media usage, the results from this study suggest that time spent on social media did not influence self-esteem and quality of life.

Occupational Therapists' Experiences Regarding the Effectiveness of Animal-Assisted Therapy

Anna J. Rembetsy-Brown

Faculty Advisor: Joanne Gallagher Worthley, Ed.D.

Graduate Project

Poster Presentation — Traditional

This study examined occupational therapy practitioners' experiences utilizing animal-assisted therapy in their occupational therapy practice and the effectiveness of the animals in supporting clients to achieve their therapeutic goals. This qualitative study investigated how animals were incorporated into the intervention sessions, the client factors that warranted the use of animals, and the client outcomes. Six occupational therapists were interviewed via Zoom and their responses were analyzed for themes utilizing the data analysis software NVivo. The intervention sessions were found to be client-centered, to have been created using the therapists' clinical reasoning skills, and to have encouraged participation, thus increasing client goal attainment. Overall, these findings suggest that the incorporation of animal-assisted therapy within occupational therapy intervention sessions was beneficial for the clients.

Perspectives of School-Based Occupational Therapist Registered/Licensed on Sensory-Based Strategies in the Classroom

Caroline J. Ricupero

Faculty Advisor: Joanne Gallagher Worthley, Ed.D.

Graduate Project

Poster Presentation — Traditional

Sensory-based strategies have gained popularity within school settings to aid in students' participation and engagement; however, there is limited research on their effectiveness. This study examined school-based Occupational Therapist Registered/Licensed (OTR/L)s' perspectives on sensory-based strategies used in the classroom setting. Vestibular and proprioceptive-based strategies used within the classroom setting were perceived as beneficial to children with various disabilities, specifically, Autism Spectrum Disorder and Attention-Deficit Hyperactivity Disorder. The OTR/Ls reported seeing improved engagement and attention in the classroom setting.

How Health Care Professionals Prioritize Physical Activity

Jordan N. Viner

Faculty Advisor: Joanne Gallagher Worthley, Ed.D.

Graduate Project

Poster Presentation — Electronic

Physical activity has abundant physical and mental health benefits that can benefit health care professionals. The purpose of this study was to explore how health care professionals prioritize physical activity. Research questions examined the rate of participation in physical activity, supports and hindrances to participation in physical activity, and physical activity habits of health care professionals. Thirty-seven health care professionals completed a 19-question Google Form survey. The target participants were recruited through Facebook posts and snowballing. Results showed that health care professionals, on average, met the global recommendation rate for moderate-intensity physical activity. However, despite meeting the recommendations, when participants were asked about their physical activity habits, many reported not following a regular physical activity routine.

Technology's Impact on the Physical and Social Development of Children: Occupational Therapy Practitioners' Perception and Role

Sarah F. Ward

Faculty Advisor: Joanne Gallagher Worthley, Ed.D.

Graduate Project

Poster Presentation — Electronic

Children in today's world have technology right at their fingertips, leading to greater amounts of time spent on devices rather than moving their bodies and interacting with peers. This study explored occupational therapy practitioners' perceptions regarding how the use of technology has impacted the physical and social development of children. A total of 41 pediatric and school-based practitioners each completed a 21-question survey. The findings indicated that practitioners have identified technology as a factor that has led to a decrease in the development of fine motor, gross motor, and social skills, impacting not only performance on school tasks, but also in their everyday lives. Technology use appears to be detrimental to child development and therefore has left practitioners with the significant role of addressing these deficits.

PHILOSOPHY

The Racialization of Schizophrenia: The Impact of Racial Stigma on Health Care Outcomes

Alix P. Barry

Faculty Advisor: Laura Kane, Ph.D.

Poster Presentation — Traditional

In this paper, I argue that racialization — the process of ascribing physical, social, and material constructs as racial — has exacerbated mental health stigma and severe health disparities in the treatment, interactions, and health outcomes for Black individuals with schizophrenia. Minority psychiatric patients face implicit practitioner bias that leads to increased diagnoses of schizophrenia among Black men and the increased implementation of extreme treatment measures, including involuntary hospitalizations, emergency antipsychotic medications, and police interventions. I argue that practitioners should adopt a narrative approach to medicine to understand the racialized history fueling negative implicit biases among practitioners. Utilizing a care ethics perspective, I suggest addressing this stigma by adopting empathy toward patients in health care and encouraging clinicians to develop self-awareness about their roles and responsibility to patients.

Nanjing: Conflict-Related Sexual Violence as a Weapon of Genocide

Cameron E. Derrick

Faculty Advisor: Henry Theriault, Ph.D.

Poster Presentation — Electronic

The Nanjing Massacre occurred in 1937 and has yet to be recognized as genocide, despite convictions declaring responsibility for excessive violence and killing. Not included in these prosecutions was responsibility or redress for the sexual violence perpetrated by the Japanese military, which led to the massacre's name "Rape of Nanjing" that is used by some scholars. Sexual violence served as a training regime for later violence and killing. Weaponizing rape and other forms of sexual violence enabled the Japanese military to decimate the population in the city as well as inflict long-term trauma and limits on the reproductive ability of survivors. The execution of actions and ultimate results both fall under categories of genocide as set by the United Nations Genocide Convention and are discussed in this presentation.

Women's Health Care: Medical Gaslighting

Cara N. Gilgun

Faculty Advisor: Laura Kane, Ph.D.

Poster Presentation — Traditional

In the health care setting, women face a great deal of bias and medical gaslighting. Often misdiagnosed or dismissed, their health experiences tend to be ignored. For centuries, theorists have taken an androcentric approach to health and health care, using males to set the standard for all human beings generally. When women's symptoms do not conform to the so-called "normal" that has been taught, women often receive inappropriate care or have their real-life experiences of sickness and pain attributed to mental health issues or lack of self-care. By adopting new teaching styles and approaches to providing acceptable patient care, I believe it is possible to improve the level of health care women are receiving.

Intersectionality and Witch Hunting in Early Modern Europe

Andja Kola

Faculty Advisor: Henry Theriault, Ph.D.

Oral Presentation

Inspired by the existing literature on witch hunting in Modern Europe, this paper provides a new way of understanding the reasons behind the witch-hunting phenomenon. The usual approach is to try to determine the dominant cause for witch hunting, such as gender oppression, class oppression, the rise of the medical establishment, nation-building, etc. This paper argues that, on the contrary, witch hunting was caused not by a single force but occurred through the intersection of the hitherto studied distinct causes. By applying the theory of intersectionality to existing scholarly sources, I attempt to fill the gap in understanding of witch hunting by showing that witch hunting happened where gender, class, religion, and nationality meet.

Choiceless Choices: What Lies on the Other Side?

Kimberly T. Vo

Faculty Advisor: Henry Theriault, Ph.D.

Oral Presentation

"Choiceless choices" is a term coined and popularized by scholar Lawrence Langer in regard to the "no-win situation faced by the Jews during the Holocaust." This term is mostly associated with studies about psychological trauma as well as the ethical dilemmas faced by Jewish survivors in the aftermath of the Holocaust. However, there is another crucial side to the occurrence of "choiceless choices": it acts as the embodiment of the perpetrators' intent to commit genocide. This presentation showcases different examples, drawn throughout history, of how perpetrators manipulated and utilized "choiceless choices" as part of the process of destroying targeted groups. As such, "choiceless choices" become the "smoking gun" which can be used by the United Nations Genocide Convention to condemn perpetrators.

PSYCHOLOGY**Lobbying for Revision of the Supplemental Nutrition Assistance Program**

Lizbeth Alcantara Ruiz; Jessica Rancourt

Faculty Advisor: Carl Herrin

Poster Presentation — Traditional

Food insecurity is the condition of not having access to sufficient food, or food of adequate quality, to meet one's basic needs. Food insecurity is becoming an increasingly prevalent problem on college campuses, particularly with confusing and unclear Supplemental Nutrition Assistance Program (SNAP) eligibility requirements and a need for donations and funding for on-campus food pantries. Many students who need SNAP support are not eligible based on dated requirements. SNAP logistics have not been adjusted since 2014. Since then, there has been inflation, COVID-19, housing shortages, and increased tuition costs. We went to Washington, DC, to encourage members of Congress to add this adaptation of SNAP to their agenda so that college students in need of this support are able to get it while still pursuing an education.

Students' Perceptions of Drawing and Coloring on Neuroscience Education

Eleni Baraklilis

Faculty Advisor: Brittany Jeye, Ph.D.

Poster Presentation — Traditional

Previous research has found different types of visual(s) and activities (e.g., drawing, coloring, using 3-D models) impact students in undergraduate neuroscience courses. The current study aimed to evaluate students' perceptions of anatomical drawing and coloring in a 200-level Sensation and Perception class. Throughout the course, students were given equal opportunities to either draw or color. At the end of the semester, students rated these activities based on interest, effort, difficulty, value, and confidence. Analyses found that there was a significant difference between both groups in difficulty but not in interest, effort, value, or confidence.

Pretend Play and Storytime: An Observational Study of the Public Library

Anna M. Belculfine; Scout R. Beaudoin; Jessica L. Rancourt; Callie Tavares

Faculty Advisor: Colleen Sullivan, Ph.D.

Poster Presentation — Traditional

Public libraries incorporate a range of programs (e.g., storytime) and resources (e.g., pretend play areas, STEM kits, arts and crafts packets) that aim to engage children and involve families. Although children's literacy skills are a primary focus of the library, observations highlight the social engagement and exploration for early childhood learning (Becker, 2012). Eleven public libraries were observed in a naturalist, qualitative study. We hypothesized that themes across libraries would involve the following available resources: creative physical play space, take-home activities, and programmed monthly events. Initial findings highlight consistent book displays around seasonal topics, parental literacy resources, and pretend play items for children. Implications will guide libraries in program and setting development to foster cognitive and social development.

Retrieval Methods in the United Kingdom vs. in the United States

Nicole L. Busha; Cara C. Prunier; Elizabeth R. Lauzonis

Faculty Advisors: Nicole Rosa, Ph.D.; Emily Soltano, Ph.D.*Funding Source:* Corcoran Scholarship

Poster Presentation — Electronic

To master complex topics, many believe students learn using one specific strategy. Roediger et al. (2014) suggest that learning is an intentional process of remembering, not a natural talent. Retrieval practice strengthens the connections in memory and makes the information stick. In our experience in the U.S., retrieval practice is consistently used to guide learning in preparation for exams. In England, the collegiate educational system curriculum is structured differently, with few opportunities to utilize retrieval practice through a semester course. Typically U.K. courses are lecture-based and a grade may rely on a final exam grade (International Student, n.d.); therefore, students in the U.S. curriculum emphasize more opportunities to interact with content in a variety of ways, offering greater retrieval practice.

The Impact of Parenting Styles on Academic Achievement and Anxiety in College Students

Julia Callahan; Haley Schollard; Scout Beaudoin; Katelyn Dicenso

Faculty Advisor: Nicole Rosa, Ph.D.

Commonwealth Honors Project

Poster Presentation — Electronic

An authoritative parenting style has been correlated with higher levels of social and emotional intelligence and higher academic achievement, while permissive and authoritarian parenting is correlated with lower academic achievement in college students. Extending previous research, the goal of our present study is to examine and develop a greater understanding on the impact of parenting styles on college students' levels of anxiety and academic achievement. We hypothesize that students with authoritarian and permissive parents will have higher levels of anxiety and lower academic achievement, while students with authoritative parents will have lower levels of anxiety and higher academic achievement.

The Role of Negative and Positive Emotions in Long-Term Face Memory Specificity

Amanda Chaires; Ava Krantz

Faculty Advisor: Brittany Jeye, Ph.D.

Poster Presentation — Traditional

Research has shown that emotion can influence memory, though there are conflicting results regarding the impacts of positive and negative emotion. In particular, this study evaluated memory specificity for emotional faces (i.e., memory for facial details). Participants were asked to remember a series of angry or happy male and female faces. They were then shown old, related, and new faces and asked to indicate whether the faces were exactly the same as the originals. Analyses will investigate how memory for the facial details changes depending on the type of emotion (e.g., do different types of emotion enhance memory?). Furthermore, we will also investigate whether facial memory specificity relies on inhibition of similar details and the impact of emotion on this inhibitory processing.

The Role of Inhibition in Short-term and Long-term Color Memory Specificity

Caitlin M. Conneely

Faculty Advisor: Brittany Jeye, Ph.D.

Funding Source: WSU Summer Undergraduate Research Grant

Commonwealth Honors Project

Poster Presentation — Traditional

The current study examined the relationship between inhibition in short-term and long-term color memory. In the short-term memory task, participants were shown two colored shapes in succession and then responded whether the shapes were the same or different colors. In the long-term task, participants remembered a series of colored shapes and, after, made old-new judgments to old, similar, and new colored shapes. Analyses suggest that inhibition is present in long-term, but not short-term memory specificity.

An Assessment of the Overall Well-being of Division III College Student-Athletes

Erica B. Hanlon

Faculty Advisor: Colleen Sullivan, Ph.D.

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

Commonwealth Honors Project

Poster Presentation — Electronic

To investigate the needs of Division III collegiate athletes, this four-point longitudinal study consisted of a holistic assessment of well-being among student-athletes with a non-athlete comparison group. Qualitative data was also collected through focus groups with student-athletes to elaborate on survey results. Preliminary results show that student-athletes had higher levels of well-being compared to their non-athlete counterparts. Further, sports factors including coach-athlete relationship and burnout correlated with well-being. Results from the fall 2022 semester reflect consistency for student-athletes in terms of mental health, burnout, and coach-athlete relationship. Final results will be shared with the greater higher education and athletic community to suggest future programming and interventions to promote athlete well-being.

Concurrent Mediators of the Challenge Appraisal – Depression Relationship during COVID-19

Meghan C. Hastings; Jenna R. Kelly; Ella R. Kilmartin

Faculty Advisor: Champika Soysa, Ph.D.

Poster Presentation — Traditional

We examined perseverative negative thinking, loneliness, mindful non-judging, and perception of resources as concurrent mechanisms that account for the relationship between dispositional stress appraisal and depression in spring and fall 2020 as well as in first-generation college students (FGCS) and non-FGCS. We studied n=266 (Time1) and n=318 (Time2) undergraduates in the U.S. during the COVID-19 pandemic. Advancing the literature, this study established that perseverative negative thinking, loneliness, and mindful non-judging accounted for the challenge appraisal – depression relationship, but that the perception of resources did not, in both spring and fall 2020 as well as in FGCS and non-FGCS. These results could inform specifically targeted interventions for depression in college students in the ongoing COVID-19 pandemic.

United Kingdom and United States Students' Application of Study Methods

Cailin E. Joyce; Rebecca E. Lovejoy; Sarah E. White; Megan R. McDowell-Arnold

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

Poster Presentation — Electronic

Academic success, regardless of where the learning occurs, depends on effective practices and strategies. Brown et al. suggest that practices such as retrieval and interleaving are effective study strategies; however, it is possible the effectiveness of these strategies depends on the mode and system of education. Using the U.S. and the U.K. education systems, we will compare students' study strategies to determine whether students are using effective strategies based on their system of education.

Learning Strategies in the United Kingdom vs. in the United States

Jennifer R. LaHair; Vanessa G. Nuamah; Kayla A. Molfetto; Yadalisse Norford

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

Funding Source: Corcoran/Sheehan

Poster Presentation — Electronic

Students are often taught strategies that make learning engaging, to keep attention and energy in class; however, most of these strategies contribute to poor learning. This is true of students in both the U.K. and U.S., who spend most of their education in learning environments that use strategies such as rereading and massed practice. Effective learning strategies, such as spaces and mixed retrieval, require work and effort to give students quality learning (Brown, et al., 2014). Learners are unlikely to embrace tactics they feel are less productive because they have become familiarized with their current studying habits. The differences between curriculums lead to U.S. and U.K. students needing to utilize separate learning strategies.

Investigating the Role of Motivation in Pursuing Higher Education between the United States and United Kingdom

Alexia N. Moreira; Breanna E. Ward; Kellie E. Blake; Silvia G. Sordillo

Faculty Advisors: Nicole Rosa, Ph.D.; Emily Soltano, Ph.D.*Funding Source:* Corcoran Study Abroad Scholarship; Sheehan Scholarship

Poster Presentation — Electronic

School instructors use different teaching methods to motivate their students to learn. Certain teaching strategies (e.g., game-based learning) work more effectively than others for reinforcing information retention, and showing clear expectations on how students can achieve a specific grade or “reward” may also lead to higher levels of motivation. We compared teaching methods employed in both U.S. and U.K. education systems and investigated how these methods contribute to external motivation in students.

Faculty and Student Perceptions of Motivational Needs: A Qualitative Analysis

Margaret E. Mullaney; Brooke Kazanovicz; Taylor Hapenny

Faculty Advisors: Colleen Sullivan, Ph.D.; Kathryn Frazier, Ph.D.*Funding Source:* Teaching and Learning Innovation Grant 2021-2022

Poster Presentation — Traditional

Self-determination theory (Deci and Ryan, 1985) suggests that humans have three psychological needs: autonomy, competence, and relatedness. When these needs are met, students will actively engage in their learning experience (Chiu, 2021). Thirty-two participants responded to four open-ended prompts on their perceived motivational and engagement supports in the classroom. Although interconnected at times, students and faculty consistently made connections to (1) autonomy and available course information, (2) competence and professor awareness, and (3) relatedness and belonging.

Bringing the Library Home: Exploring Accessibility and Use of Library Resources

Jessica L. Rancourt; Callie Tavares; Anna M. Belculfine; Scout R. Beaudoin

Faculty Advisor: Colleen Sullivan, Ph.D.

Commonwealth Honors Project

Poster Presentation — Traditional

The library is a community center that goes beyond literacy involvement. Families also use libraries as a play space and socialization outlet. For example, one of the primary reasons children attend storytimes is for social interaction with other kids (Cahill et al., 2020). Limited research on family engagement in libraries exists, particularly with parent perspectives on resources. Survey results from parents/caregivers from regional libraries were explored with consideration to accessing and using resources inside and outside of the library. Results will provide the parent's perspective on the utilization of library resources and add to the limited literature on this topic. Implications can benefit libraries and families to further foster developmental trajectories and experiences.

Concurrent Mediators of the Challenge Appraisal – Anxiety Relationship During COVID-19

Brianna T. Remy; Kate E. Desruisseaux; Emily A. Salonich

Faculty Advisor: Champika Soysa, Ph.D.

Poster Presentation — Traditional

We examined negative thinking, mindful non-judging, loneliness, and resource perception, as concurrent mechanisms that account for the relationship between dispositional appraisal of stress as a challenge (challenge appraisal) and anxiety in spring (Time1, n=266) and fall (Time2, n=318) 2020 as well as in first-generation college students (FGCS) and non-FGCS. Advancing the literature, this study established that negative thinking, mindful non-judging, and loneliness accounted for the relationship between challenge appraisal and anxiety, but that the perception of resources did not, both in spring and fall 2020 and as well as in FGCS and non-FGCS. These results could inform specifically targeted interventions for anxiety in college students, in the ongoing COVID-19 pandemic.

How the United States and the United Kingdom Are Expanding Access to Higher Education

Arhum Rizvi; Sarah Stewart; Annabella Demattia

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

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

Poster Presentation — Traditional

The United States and the United Kingdom share a common goal to expand access to higher education. One way the United Kingdom is working toward this goal is focusing on the structure of student loans. Both the United States and the United Kingdom recognize the importance of socioeconomic upbringing as a determining factor for higher educational opportunities. Another strategy for combating access to higher education is providing more funding to schools with low-income students. This project will examine how the U.S. and U.K. education systems expand the access to higher education financially.

Maternal Well-being: The Role of Intensive Mothering Beliefs and Parenting Behavior

Arhum Rizvi; Alix Barry

Faculty Advisors: Kathryn Frazier; Jacquelyn Raftery-Helmer

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

Poster Presentation — Traditional

Intensive mothering refers to the belief that mothers must fully devote themselves to rearing their children; however its links to parenting behavior and maternal well-being are unclear. Mothers (N =284) completed a survey assessing intensive mothering beliefs, parenting behavior, and mental health. Essentialist beliefs (that mothers are naturally skilled at parenting) predicted worse mental health and maladaptive parenting behaviors. Findings suggest that components of intensive mothering may impact mothers differently and nuanced study is needed.

The Impact of Memorability on the Attentional Blink

Silvia G. Sordillo; Angela M. Nigro
Faculty Advisor: Brittany 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). In the current experiment, we are interested in determining whether the memorability of an item induces an attentional blink and, further, whether memorability is similar to emotion in how it captures attention. Participants were asked to spot a single target within a rapid serial visual presentation of items where either a highly memorable, not memorable, or scrambled image preceded the target as a distractor by either two or eight images. Analyses will investigate whether the memorability level of the distractor impacts participants’ abilities to find the target (i.e., the attentional blink).

Different Types of Online Interactions Influence Memory for Photo Details

Sarah Stewart; Makayla Frantz

Faculty Advisor: Brittany Jeye, Ph.D.

Poster Presentation — Traditional

Building off prior work examining how taking, editing, and viewing photos can shape memory, the current project investigates whether the ways in which people interact with photos (such as on social media) influence what they subsequently remember. Participants were first shown a series of photos and asked to either select an emoji, provide a hashtag, or retype the name of the image (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 found that participants who were in the hashtag group were significantly more likely to remember the photos than those in the control or the emoji groups.

Effective Teaching Strategies and Their Application: A United States and United Kingdom Comparison

Jaqueline E. Tallino; Taylor H. Hapenny; Sarah A. Willcox

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

Funding Sources: Worcester State Honors Grant, Corcoran Study Abroad Scholarship

Poster Presentation — Electronic

Students entering colleges and universities often have well established study habits and patterns; however, these habits may not be the most effective (Brown et al., 2014). This study takes a deeper look at effective learning techniques and the extent to which professors discuss effective learning strategies with their students in the United States vs. the United Kingdom. We will also discuss whether the benefits of learning a new study strategy outweigh the effort it takes to learn to do them and whether this contributes to a shift in the most typical study habits of students.

Supports for Visual Comparison in Science Learning

Andja Kola

Faculty Advisor: Benjamin Jee, Ph.D.

Poster Presentation — Electronic

Students must often compare multiple diagrams when learning about abstract systems and processes in science. We conducted an experiment to test whether such comparisons are more effective when two diagrams are arranged in a way that highlights their structural commonalities. Participants were presented with a brief lesson about the evolution of Galapagos tortoises that contained diagrams of key concepts in natural selection such as variation and inheritance. Afterward, participants were asked to describe and explain related diagrams about the evolution of the peppered moth. We varied whether the tortoise and moth images were arranged to facilitate comparison. Our prediction is that students will express a greater number of scientific ideas in their explanations when the diagrams are easier to compare.

SOCIOLOGY**DROVE-Mass: Deciphering the Relationship between Overdose and Violent Crime Effects in Massachusetts**

Spencer Annis

Faculty Advisor: Alex Briesacher, Ph.D.

Poster Presentation — Traditional

The following study models violent crime and drug use between 2018 and 2022 in Massachusetts. In terms of the crime rate, I will look at specific categories of violent crimes per county and look at the rates of overdose to test for reciprocal effects. Do drugs cause crime or do crimes cause drug usage? Given the time period of the data, a specific analysis will look at the effects of COVID-19 on the relationship between variables.

Family Dynamics in Television

Courtney Pope

Faculty Advisor: Alex Briesacher, Ph.D.

Poster Presentation — Traditional

Family dynamics are ever growing and what has become acceptable from “traditional” norms has vastly changed throughout history. Television is no exception and, in most instances, has been something that television creators and writers have come to recognize. This research conducts a content analysis of various popular television programs that embrace the diversity of family dynamics and stray away from the idea of a traditional “nuclear family.”

Milwaukee’s Failure to Protect Konerak Sinthasomphone

Savannah J. Stowe

Faculty Advisor: Alex Briesacher, Ph.D.

Poster Presentation — Electronic

The death of Konerak Sinthasomphone is widely regarded as a tragedy and violation of his civil rights, highlighting the intersection of race, sexual orientation, age, and gender. His untimely demise, when police returned him to Jeffrey Dahmer’s apartment to die, sparked protests and strengthened people of color’s collective voice. People of color refused to be silenced like they were when Dahmer was active and most violent. Since then, the true crime genre has gained new popularity, but also brought concerns of desensitization and detachment with grisly murders. This project deconstructs the events surrounding, public reaction to, and media construction of Sinthasomphone’s murder.

Weeding Out the Cops: Policing and Restrictive Spatial Design in the Neoliberal Public Library

Zadia M. Valenze

Faculty Advisor: Francisco Vivoni, Ph.D.

Poster Presentation — Traditional

As local governments embrace neoliberalism and cut funding to public services and spaces, public libraries feel pressure to conform to neoliberal ideals through police or security forces, staff interactions, policy changes, and changes in the spatial design of the library. Participant observations of Central and Western Massachusetts urban public libraries were completed to assess how neoliberalism, policing, and spatial design intersect and impact the functions and usage of those libraries, particularly among youth, people of color, and the unhoused. Libraries that leaned into neoliberalism, policing, and restrictive spatial design experienced more conflicts, burnout, and dissatisfaction. Potential solutions for these problems include divesting from police and the values of policing, setting up youth-run spaces, and using trauma-informed design principles in library spaces.



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