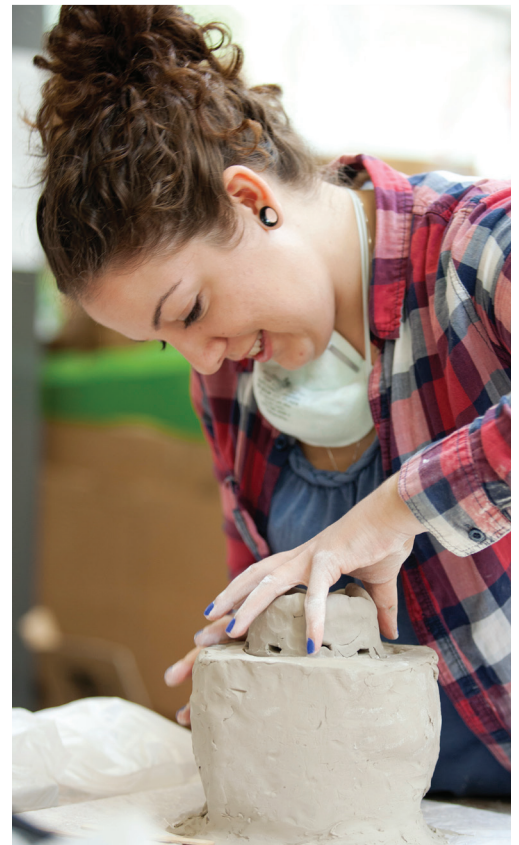


CSC

CELEBRATION
OF
SCHOLARSHIP
& CREATIVITY

APRIL 12, 2017



WORCESTER
STATE
UNIVERSITY

2017 SCHEDULE OF EVENTS

FOSTER ROOM SCHEDULE

10 a.m. – 10:30 a.m.

Election 2016: Philosophical, Economic, and Political Approaches to the Complexities Beneath the Surface

Katie Commerford, Katen Huu, and Nicholas Wurst

10:45 a.m. – 11:15 a.m.

Almost, Maine Costume Design

Jasper Bliss

11:30 a.m. – 12 noon

Identity Salience and Activism in Policy Debate

Janet Novak

12:15 p.m. – 12:45 p.m.

Women Fashion Magazines Reflection of the Changing Attitudes and Opinions of Women in America

Vanessa O'Donnell

1 p.m. – 1:30 p.m.

Phenomenologies of Religious Beliefs

Kennedy Damoah

1:45 p.m. – 2:15 p.m.

Precisionism: A Brief History and Comparative Application of Kant's and Collingwood's Aesthetic Philosophies

Elizabeth Bridleman

FALLON ROOM SCHEDULE

10 a.m. – 10:30 a.m.

Community Media Update: Creating Political Profiles of Worcester and The Beat

Samantha Carroll, R.J. Sheedy and Ashley Anthony

10:45 a.m. – 11:15 a.m.

Inhibition of Nuance in A 'Fast-Food Facts' World

Ryan Lindsay

11:30 a.m. – 1:30 p.m.

Visual and Performing Arts Creative Projects

Rona Balco, Paris Bourdreau, Midaly Carrasquillo, Aimee Chang, Kimberly Collazo, Kasey Gillen, Nicole Huss-Howland, Shannon Richards, Pamella Saffer, Debbie Tran, and Nathen Wheeler

1:45 p.m. – 2:15 p.m.

Obesity Prevalence and Parent's Perceptions of Eating Behaviors in Children with Autism Spectrum Disorder (ASD)

Olivia Guilmette, B.S. and Julia Bagarella, Junior

Celebration of Scholarship and Creativity

Welcome to the tenth annual Worcester State University Celebration of Scholarship and 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 and faculty.

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 presentations, panels, posters, and performances across every discipline of study from the natural sciences, 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

Preparation of a Research Manuscript Describing the Effects of Phosphorylation Site Mutations on the Function of the Yeast Protein Bud3

Alexis Anderkin

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

A Commonwealth Honors Project

In *Saccharomyces cerevisiae*, Bud3 localizes to the mother-bud neck, promoting axial budding, and also directs Clb2 to the bud neck for normal cell cycle progression. We studied the effects of Bud3 phosphorylation site mutations on these processes and will present our research manuscript for publication. Our results indicated phosphorylation has minimal effects on bud site selection, but affects cell cycle progression.

A Review of Myocarditis Immunosuppressive Therapies

Anthony J. Bement, Roger S. Greenwell, Ph.D.

Faculty Advisor: Roger S. Greenwell, Ph.D.

Funding Source: WSU Faculty Mini-Grant

A Commonwealth Honors Project

Myocarditis is a precursor of dilated cardiomyopathy – the most frequent reason for heart transplantation. Combinatorial treatments of immunosuppressants have been shown to improve poor prognosis, thus increasing yield survival times compared with those of untreated affected patients. This review includes a synopsis of recent immunosuppressant treatment trial results and recommendations for future treatment options.

Familial Cold Autoinflammatory Syndrome

Christian Cedullo

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

Familial Cold Autoinflammatory Syndrome (FCAS) is a condition that exhibits inflammatory symptoms after being exposed to cold temperatures. This condition, inherited in an autosomal dominant pattern, is caused by a missense mutation in the NLRP3 gene. This gene is responsible for the formation of the protein cryopyrin and manifests as a gain-of-function mutation, leading to excess production of the inflammasome IL-1(beta).

Genome Annotation of *Drosophila elegans***

Abena Benefaa Darkwah

Faculty Advisor: Daron Barnard, Ph.D.

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

Genome annotation interprets large genomic sequences into useful DNA sequences. *D. melanogaster* is a genetic model organism with close evolutionary relationship with *D. elegans*. This study involved identifying the genes on a segment of 80kb on chromosome 3L in *D. elegans*, and their reading frame sequences. The gene model suggests that the Ten-m gene is a protein-coding gene with 3 mRNAs and 13 exons.

Characterization of an Environmental *Pseudomonas* Isolate that is a Rapid Biofilm Producer

Anthony Esposito

Faculty Advisor: Roger S. Greenwell, Ph.D.

Funding Source: WSU Faculty Mini-Grant

Bacteria that form biofilms are a problem in the medical field due to the difficulty in treating the organisms with antibiotics, and in removing the biofilm itself. An environmental *Pseudomonas* isolate (D11) was identified that inhibits the growth of other bacteria and also rapidly produces a biofilm on rich media. This work seeks to further investigate the phenotype and characteristics of *Pseudomonas* isolate D11.

Microbiology Spotlight on the Radiation-Resistant Bacterium *Deinococcus radiodurans*

Jordan Miglionico

Faculty Advisor: Roger S. Greenwell, Ph.D.

Deinococcus radiodurans is a gram-positive bacterium that can withstand extreme and deadly amounts of radiation. Since its discovery approximately 50 years ago in a can of spoiled meat, this bacterium has been studied extensively due to its unique characteristics. This presentation will focus on the structural and functional characteristics of *Deinococcus radiodurans* as well as provide information about the organism's genome.

A Genetic Understanding of Hemophilia**

Jennifer Murphy

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

This study focuses on the genetic details of hemophilia, a blood-clotting disorder that results in uncontrollable bleeding episodes. It is caused by a non-functional gene due to an x-linked recessive mutation, which leads to a lack of clotting factors in the blood. This study investigates the pattern of inheritance and the mechanism of mutation responsible for hemophilia.

Captive Reared *Pseudemys rubriventris* Hatchlings Grow Faster than Their Wild Counterparts

Tiffany Perron

Faculty Advisor: Nirvana Filoramo, Ph.D.*Funding Source:* Massachusetts Division of Fisheries and Wildlife

The Massachusetts Division of Fisheries and Wildlife (MDFW) is employing 28 state institutions to raise endangered *Pseudemys rubriventris* hatchlings to the size of three-year-old turtles in nine months in an effort to increase their chances of survival upon their release into the wild. Analysis of weight and carapace length data from these facilities (from 2010-2016) showed the growth rates of captive reared hatchlings were faster than those in the wild, pointing to the success of the program.

BIOTECHNOLOGY**Nitroxyl (HNO) Reactions with Selenocysteine and Selenoproteins: A Novel Therapeutic**

Edward Dressler, Rachael Messier

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

Nitroxyl's (HNO) chemical reactivity has made it a promising therapeutic agent, specifically in its ability to inhibit proteins containing a nucleophilic active site. TrxR is a seleno-enzyme involved in many cellular regulatory processes, including cell proliferation, and several TrxR inhibitors are currently being tested as cancer therapeutics. In this research, we examine the ability of HNO to inhibit TrxR1 activity.

Microbiology Spotlight on the Bioluminescent Bacterium *Vibrio fischeri*

Sara Hellewell

Faculty Advisor: Roger S. Greenwell, Ph.D.

The bioluminescent bacterium *Vibrio fischeri* forms an essential symbiosis with the Hawaiian bobtail squid, *Euprymna scolopes*, but its glow is not just for looks. Rather, after forming a biological connection with the squid, the bacterium can help *Euprymna scolopes* to avert predators and assist in finding prey. This presentation will highlight the distinguishing characteristics and importance of this vibrant organism.

Vero Cell Viability and Proliferation*

Joiha M. Huguenin, Lauren Hughes, Frederick Ofori-Atta, Joshua Painter, Adrienne Smyth, Ph.D.

Faculty Advisor: Adrienne Smyth, Ph.D.

The Vero cell line is used for vaccine production. Companies are trying to limit the use of media containing serum due to many problems, so they use a serum-free medium. Using aseptic tissue culture techniques, plant-derived substances were investigated for this study with the goal of stimulating cell proliferation and assayed by colorimetric methods. Preliminary results suggest a dose response for cayenne and turmeric extract.

The Effect of Antibiotics on the Microbial Diversity of Salt Marsh Soil*

Casey Kilgus, Deysy Pinto Rodriguez

Faculty Advisor: Maura C. Pavao, Ph.D.

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

Antibiotics are regularly used in medicine and agriculture, which leads to biologically active chemicals contaminating the surrounding environment and thus contributing to the rise of antibiotic-resistant pathogens. The purpose of this project was to study the effect of ampicillin on the microbiome of salt marsh soil by using a metagenomics analysis with Winogradsky columns and 16s rRNA gene sequencing with Illumina technology.

Identifying Members of the Soil Microbiota of Worcester Area Parks*

Isaac Ofori

Faculty Advisor: Roger S. Greenwell, Ph.D.

Funding Source: WSU Faculty Mini-Grant

Our goal is to identify and characterize the bacteria present in the soils of five different local parks in Worcester. We have cultured individual microbes and created a library, and are performing a 16S rDNA diversity study using NGS to determine the microbial population identity and diversity. We will monitor population changes over time and discover microbes that can be further investigated for bioactive properties.

BUSINESS ADMINISTRATION

Reyes House Access to Health Care**

Lauren Brown, Megan Foley, Sarah Khallady

Faculty Advisor: Joan Mahoney, Ph.D.

Funding Source: The Robert Wood Johnson Foundation

A Commonwealth Honors Project

Reyes House is a post-detox residential facility for Hispanic males recovering from substance abuse. We developed a presentation program to inform the residents of Reyes House about health insurance, the necessity of securing a primary care physician, the benefits of physically preparing to re-enter the workforce, and related it to their goals. We also partnered with the Worcester Lions Club to provide health screenings using its Sightmobile, a traveling diagnostic lab that provides testing for vision and hearing.

Marketing Enactus**

Amber Suarez

Faculty Advisor: Joan Mahoney, Ph.D.

A Commonwealth Honors Project

For my project, I have decided to study the marketing strategies needed in order to create an impactful video for the Worcester State Enactus team. The purpose of this video will be for competition and for long-term usage of promotional advertisement. As director of public relations for this team, it is my duty to represent the organization in a positive, innovative, and effective manner.

CHEMISTRY

The Removal of Phosphates from an Aqueous Solution Using a Bicomposite Metal

Tatiana Buchannan, Maria Markopoulos

Faculty Advisors: Jeremy R. Andreatta, Ph.D., Joseph Quattrucci, Ph.D.

Adsorption is a method of water decontamination to remove oxyanions that pose a threat to the environment. This experimental study resulted in the synthesis of an inorganic bicomposite adsorbent. Its ability to remove phosphate from an aqueous solution was exhibited via UV-VIS spectroscopy. Various pH and phosphate concentrations were examined to determine the most effective conditions for phosphate removal.

C-H Activation and Functionalization of Arenes Using Ir Catalysts

Tatiana Buchannan, Maria Markopoulos, Margaret E. Kerr, Ph.D.

Faculty Advisors: Jeremy R. Andreatta, Ph.D., Margaret E. Kerr, Ph.D.

Previous work has demonstrated that C-H bond activation and functionalization is attainable for a Cp*Ir catalyst. C-H functionalization involves the cleavage of an aryl or benzyl C-H bond mediated by a carbonate base, and replaces it with a C-X bond. In this experiment, C-H activation was explored by using a new substrate scope that involved alcohols, conjugated alcohols, amides, and amino acids.

Hybrid Quantum/Molecular Mechanic Study on the Reaction Mechanism of Nitroxyl and Thiol Derivatives

Tadas Buivydas

Faculty Advisor: Joseph Quattrucci, Ph.D.

Nitroxyl (HNO) is a nitrogen compound that has been shown to strongly react with thiols, while reactions with selenothiols have exhibited lower energetic barriers than that of sulfur analogues. To determine the kinetics under physiological conditions, hybrid quantum/molecular mechanic calculations regarding the reactivity of various thiols with HNO were carried out to determine the thermodynamic properties of the system.

Computational Analysis of the Stabilization Energy Contributions of Individual Hydrogen Bonding Interactions in Parallel-Stacked Guanine Tetraplexes

Tyler Clausen, Katelyn Rioux, Judy Marriki, Carly Doyle, Diana Riggieri

Faculty Advisors: Eihab Jaber, Ph.D., Jeffrey C. Nichols, Ph.D.*Funding Source:* Worcester State Foundation Student Research, Scholarship, and Creative Activity Grant

G-tetramers are stabilized by eight G-G hydrogen bonds and ligand bonds to a central cation. We present a novel computational methodology that has facilitated the characterization of each individual hydrogen bond's energy contribution to the complex's stability while selectively breaking individual bonds. This methodology will be utilized to elucidate the formation dynamics of parallel-stacked Guanine Tetraplexes.

Iridium Complex as Catalyst for C-C Bond Formation

Erin Hickey, Joan Racicot

Faculty Advisors: Jeremy R. Andreatta, Ph.D., Margaret E. Kerr, Ph.D.

Previous work has demonstrated that C-H bond activation and functionalization is attainable for a Cp*Ir catalyst. C-H functionalization involves the cleavage of an aryl or benzyl C-H bond mediated by a carbonate base, and replaces it with a C-X bond. C-H activation was explored using a new substrate scope that involved various alkenes and alkynes.

Experimental and Computational Investigation of Molybdenum Complex Isomerization Kinetics

Erin Hickey, Pandora Rouillard, and Alexander Zielinski

Faculty Advisors: Jeremy R. Andreatta, Ph.D., Joseph Quattrucci, Ph.D.

We investigated the kinetics of the cis-trans isomerization of $\text{Mo}(\text{CO})_4(\text{PPh}_3)_2$. Rate constants were found by observing the change in the intensity of the 2014 $1/\text{cm}$ infrared carbonyl signal as a function of time. By performing the reaction at various temperatures, the activation energy of the reaction can be determined. To support our findings, the activation energy was investigated computationally using Gaussian.

What's in Your Apples?++

Lauren Hughes, Kathleen C. Murphy, Ph.D.

Faculty Advisor: Kathleen C. Murphy, Ph.D.

With much of today's food sources coming from large-scale farms, the use of pesticides has increased to prevent devastating crop losses. Boscalid is a common fungicide used on apples. In this experiment, store-bought apples were prepared using the QuEChERS pesticide extraction method, and further analyzed for boscalid by using HPLC and LC/MS technologies. We expect to quantify the amount of boscalid, if it is present.

Phosphate in Detergents: A Greener Spectroscopic Method

Ryan Lindsay

Faculty Advisor: Meghna Dilip, Ph.D.

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

An antimony-free spectrophotometric method to determine phosphate concentration was investigated for use in an undergraduate lab. The new technique proposed utilizes fewer hazardous chemicals than the standard method (EPA Method 365.3) and is conscientious of waste prevention, with reduced sample volumes and reduced molar concentrations of reactants. This method was tested using Arm and Hammer® and Finish.

Stabilization of Chelating Complexes Using Computational Analysis

Travis Rivera, Tyler Clausen

Faculty Advisor: Eihab Jaber, Ph.D.

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

Bidentate chelating ligands of a metal ion result in a more stable molecule due to the chelate effect in comparison to monodentate ligands. The enthalpic contribution to the stabilization of metal ion complexes was examined as ligands change from monodentate to bidentate. This work aims to establish periodic trends in stability as the denticity of the ligand increases, via computational analysis.

Phosphate Analysis of Water Bodies in Central Massachusetts**

Sandra Sisko

Faculty Advisors: Kathleen C. Murphy, Ph.D., Timothy L. Cook, Ph.D., Daron Barnard, Ph.D.

In this experiment, phosphate levels were measured in several water bodies throughout Central Massachusetts, including Lake Ellie and Patch Reservoir. Elevated levels of phosphate may appear in surface water, causing plants to grow excessively. During their biodegradation, dissolved oxygen becomes diminished. This process of eutrophication negatively impacts the aquatic habitat. Elevated phosphate levels were also observed in frog embryos.

Dissociative Spillover Mechanism of Molecular Hydrogen on Nickel-Decorated Graphene

Alexander Zielinski

Faculty Advisor: Joseph Quattrucci, Ph.D.

Hydrogen is a promising alternative to hydrocarbon fuels, and a possible method for the storage of the element may be on carbon nanotubes. A mechanism known as spillover is hypothesized to increase hydrogen storage on these metal-decorated nanotubes. In this study, the spillover mechanism on nickel-decorated graphene was investigated computationally where a potential energy surface was established to perform dynamics calculations.

COMMUNICATION

Community Media Update: Creating *Political Profiles of Worcester* and *The Beat***

Samantha Carroll, R.J. Sheedy, Ashley Anthony
Faculty Advisors: Julian Berrian, Daniel Hunt, Ph.D.

The Center for Community Media creates and disseminates media content that educates audiences on current events. In this presentation, students will discuss their experiences in creating two Web-based video programs: the *Political Profiles of Worcester* series, which includes short interviews with local political figures; and *The Beat*, a student-run news and talk program that showcases interviews with newsmakers and community members.

Re(meme)bering the 2016 Presidential Election

Mia Koutoulas and Daniell Jailliet
Faculty Advisor: Julie Frechette, Ph.D.

During the 2016 presidential election, memes (images with a slogan) played an important role in the representation of the political candidates. With the increased availability of meme generators and rapid communication on social media platforms, memes have become a popular mode of political discourse. This research critically examines the influence of the political memes that were shared during the 2016 election.

Women Fashion Magazines: Reflection of the Changing Attitudes and Opinions of Women in America**

Vanessa O'Donnell
Faculty Advisor: Emanuel Nneji, Ph.D.

What influence do magazines hold over women's sense of self and the attitudes of the American people? This research will seek to answer this question by investigating whether the objectification of women in magazines is changing and exploring several magazines in the media (*Cosmopolitan*, *Glamour*, and *Seventeen*). A sample was analyzed for positive and negative elements through front cover photos and stories.

COMMUNICATION SCIENCES AND DISORDERS

Speech-Language Pathology Therapy Approaches in a Preschool Setting**

Jessica Andrzejewski
Faculty Advisor: Susanna Meyer, Ph.D., CCC-A

My independent study, which involved working with a speech-language pathologist in a preschool, provided an opportunity to study successful therapy sessions. Speech-language pathology (SLP) therapy was provided to preschool students between three and five years of age. The students were presented with a variety of diagnoses, and the SLP therapy provided services such as co-treatment, pull-out interventions, group sessions, and collaborative classroom sessions.

Teaching Spelling to Children with Hearing Loss

Allison Baker
Faculty Advisor: Susanna Meyer, Ph.D., CCC-A

My internship in a school for the deaf provided opportunities to observe the teaching of spelling using multiple modalities and strategies. Five students varying in age, degree of hearing loss, first language, and comorbid diagnoses were taught using various visual and tactile modalities dependent on their strengths and challenges. Examples of these methods included finger spelling, visual phonics, and smart board technology.

Biological Calibration in Clinical Audiology

Kayla Humphrey, Steven LaFortune
Faculty Advisor: Susanna Meyer, Ph.D., CCC-A

Biological calibration of audiometric equipment is performed weekly to ensure that the equipment is within calibration standards. The pure tone audiometer is checked by determining thresholds from 250 to 8000 Hz, and immittance equipment is checked by using a standardized GSI Test Cavity and a tympanogram. These biological tests indicate that there was minimal variation in the weekly values, thus ensuring reliable clinical testing.

COMMUNICATION SCIENCES AND DISORDERS – SPEECH-LANGUAGE PATHOLOGY

Hearing Conservation for Student EMTs and Paramedics*

Erin Aleicho, Jocelyn Hurst

Faculty Advisor: Susanna Meyer, Ph.D., CCC-A

Funding Source: WSU Faculty Mini-Grant

Sixteen EMT and paramedic students participated in a hearing conservation program, in which they received hearing screenings and completed Knowledge, Attitude and Behavior (KAB) Questionnaires before and after the program. Students learned about noise, its effects on hearing, and effective hearing protection. The KAB results indicated positive changes in knowledge and attitudes, but not beliefs.

Disproportionate Over-Identification of English Language Learners (ELLs) as Language Impaired*

Elizabeth Johnston

Faculty Advisor: Kristina A. Curro, Ph.D.

Funding Source: CHIPS in Action

Since English Language Learners (ELLs) are over-identified as language impaired when they may instead have a language difference and/or delay, this project aims to educate teachers about language delay, difference, and disorder, and to increase their competency to identify a language disorder. The project is awaiting approval for dissemination at a Worcester public school. Findings from pre-/post-test data could be generalized to other schools.

Clear Speech Training for Art Students*

Susanna Meyer, Ph.D., CCC-A, Ann Veneziano-Korzec, M.S., CCC-SLP, Linda Larrivee, Ph.D., CCC-SLP, Rainy Logan, Alison Hickey

Faculty Advisors: Susanna Meyer, Ph.D., CCC-A, Ann Veneziano-Korzec, M.S., CCC-SLP, Linda Larrivee, Ph.D., CCC-SLP

Eight visual arts students participated in a clear speech training program that focused on techniques to improve speech intelligibility for listeners with communication disorders. Students gave brief presentations before and after training; during the training, they practiced using clear speech. Results showed improvements in visual aspects of communication such as the use of gestures, eye contact, and facial expressions.

COMPUTER SCIENCE

Big Data Technology Integration

Jonathan Povers

Faculty Advisor: Elena Braynova, Ph.D.

Businesses currently face the challenge of integrating technologies as well as solving cases involving technological processes. My study involves developing an architecture and process to solve business-use cases with a variety of technologies that range from one to 30 years old. By creating this process using Big Data, Mainframe, and other software programs, we are able to process data and solve our business case.

Bank Marketing Campaign: Predicting Customer Response

Sudarshan T.

Faculty Advisor: Elena Braynova, Ph.D.

A Commonwealth Honors Project

This project focuses on predicting the response of a customer to a bank's marketing campaign. I am using a data set provided by a Portuguese bank. Various data analysis and data-mining algorithms are used to uncover interesting patterns. The data analysis and data mining are done using Sci-kit learn library, R, and Python. The project results can be used to improve the success rate of future bank marketing campaigns.

EDUCATION – SCHOOL PSYCHOLOGY
The Neuropsychology of Generalized Anxiety Disorder*

Christine Campbell, M.Ed.

Faculty Advisor: Diane T. Cooke, Ph.D.

This poster examines the signs, symptoms, and neuropsychological origins of generalized anxiety disorder (GAD). Treatment options including therapy and medication, as well as implications for school-aged children, will be presented.

Measuring School Psychologists' Effectiveness: Generalizing Social Skills*

Christine Campbell, M.Ed., Denise Foley, Ed.D., NCSP

Faculty Advisor: Denise Foley, Ed.D., NCSP

This poster was presented at the National Association of School Psychologists Convention on February 22, 2017. Generalization of skills from trained to untrained contexts is the goal of interventions, yet how do we measure generalization in real-world settings? Using single-subject multiple base procedures, we measured middle school students' use of social skills inside versus outside a group setting.

The Neuropsychology of Bilingualism and Executive Control*

Deborah DeSouza Carvalho

Faculty Advisor: Diane T. Cooke, Ph.D.

This study discusses the positive effect of utilizing two languages on a daily basis on executive control in bilinguals. Brain structures such as the left inferior frontal gyrus (IFG), the anterior cingulate cortex (ACC), the left striatum, and the left inferior parietal lobe play crucial roles in bilingual language control.

The Neuropsychology of Giftedness*

Molly Cole

Faculty Advisor: Diane T. Cooke, Ph.D.

The definition and identification of academic giftedness will be discussed, as well as the neuropsychological implications of the ability. Research has shown that gifted students have more active synapses than typical peers; other findings show that gifted students frequently rely on their left hemisphere, which is the language center of the brain.

Improving Behavior in Elementary Classrooms (and Beyond) with Brief Mindfulness Intervention*

Molly Cole, Marissa DePaolo

Faculty Advisor: Denise R. Foley, Ph.D.

For this study, twice-weekly mindfulness training was conducted in two inclusion classrooms over five weeks, which was associated with increased self-awareness and improved behavior in 3rd- and 5th-graders. We will also share how we are extending mindfulness practices to 6th-, 7th-, and 8th-grade students.

Neuropsychology of Pediatric Cancer Treatment: The Life-Long Implications of Central Nervous System Prophylaxis on Survivors*

Deanna Connolly

Faculty Advisor: Diane T. Cooke, Ph.D.

In recent decades, there have been significant advances in treatment for childhood cancer, specifically those that require Central Nervous System (CNS)-focused therapies. With the vast majority of children now surviving treatment, the question has shifted from "How can we treat this?" to "What are the implications of the treatment we use?"

The Neuropsychology of Down Syndrome and Implications for School-Based Assessment and Intervention*

Sheila Cremin

Faculty Advisor: Diane T. Cooke, Ph.D.

Down syndrome is one of the most frequently occurring neuro-developmental genetic disorders in children and the most common genetic cause of intellectual impairment. Because Down syndrome is diagnosed early on with genetic testing, the importance of psychoeducational assessment is to generate and inform intervention strategies based upon the child's unique profile of abilities rather than providing a diagnosis.

Neuropsychology of ADHD and the Frontal Lobe***

Marissa C. DePaolo

Faculty Advisor: Diane T. Cooke, Ph.D.

Attention deficit hyperactivity disorder (ADHD) is characterized by developmentally inappropriate degrees of inattention, impulsiveness, and hyperactivity. People with this disorder, as well as those with frontal lobe damage, generally display disturbances in each of these areas, with different levels varying from person to person. Common deficiencies include difficulty with executive functioning and emotional regulation.

Effects of Prenatal Exposure to Opiates on the Developing Brain*

Stacey Fredrickson

Faculty Advisor: Diane T. Cooke, Ph.D.

The recent opiate crisis has led to an increase in prenatal opiate exposure in children, which affects brain development in many ways and can lead to life-long disorders. It is important for schools to understand prenatal opiate exposure – the disorders that it can lead to and treatment options – so that they are best able to serve their students.

The Neuropsychology of Prenatal Alcohol Exposure*

Hilary Mason

Faculty Advisor: Diane T. Cooke, Ph.D.

Exposure to alcohol during gestation can cause persistent abnormalities in physical and cognitive development (Larkby, 1997). Fetal Alcohol Syndrome (FAS) is one possible outcome of such exposure and is characterized by prenatal or postnatal growth deficiency, craniofacial anomalies, and central nervous system dysfunction (Mattson, 1998).

The Neuropsychology of Childhood Epilepsy*

Natalia Szulc

Faculty Advisor: Diane T. Cooke, Ph.D.

Epilepsy is the fourth most common neurological problem that affects an estimated 150,000 people annually, with rates being higher in children. Children with epilepsy are faced with immediate and long-term effects that manifest in physical, psychological, and social/emotional challenges. To help care for these children across various settings, awareness is needed for epilepsy symptoms and triggers, diagnosis, and treatment.

ENVIRONMENTAL SCIENCE

Worcester State University Rain Garden

Pierre Aubin, Rachel Green, Steve Gamari

Faculty Advisor: William J. Hansen, Ph.D.

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

In our effort of promoting and applying the concept of a “green environment” at Worcester State University, our Wellness Center is built on top of a rain garden tank, which can sustain about 20,000 gallons of runoff water. While the rain garden concept may seem small, it produces substantial environmental and community benefits.

Benefits of Antibodies for Early Detection of *Mycobacterium tuberculosis***

Vi Buily

Faculty Advisor: Douglas E. Kowalewski, Ph.D.

Mycobacterium tuberculosis (MTB) has been one of the world's leading causes of death by bacterial infection. This bacterium is multi-drug resistant, causing those that are infected to endure long and often expensive treatments. Research has shown that antibodies can be a reliable source in detecting TB, and an early diagnosis can lead to a shorter treatment process.

Population Rise of the Carolina Wren, Indicating a Warming Pattern in Massachusetts**

Adam Darmody

Faculty Advisor: William J. Hansen, Ph.D.

Funding Source: WSU Faculty Mini-Grant

In Massachusetts, many have regarded the unusually warm winters as an indication of global warming, a trend that has sparked controversy. Evidence can be found with the aviary species Carolina wren, once considered to be rare in Massachusetts due to the traditionally cold winters; however, the Carolina wren population has increased in Massachusetts over the last few decades as the regional climate has grown warmer.

Correlation Between Temperature Change and Population Change

Nik Gjanci, Herman Servatius

Faculty Advisor: William J. Hansen, Ph.D.

We examine the correlation between temperature and population change in the state of Massachusetts. The state is characterized by increasing population in fairly controlled locations in addition to extensive temperature records. Temperature data is compared to census records throughout the state. We identify demographic shifts from the mid-20th century to 2010, and examine their relationship to shifting temperatures.

Preliminary Examination of Forces Driving Diatom Populations in Massachusetts

James LeNoir, Joan Beskenis, Paige Petit, David Wong

Faculty Advisor: Douglas E. Kowalewski, Ph.D.

Funding Source: Massachusetts Department of Environmental Protection

Benthic samples for diatom analysis to assess water quality were collected at streams and rivers in Massachusetts. The study included reference sites as determined by use of a human disturbance model as well as sites that were part of our probabilistic sampling. Non-parametric statistical analyses demonstrated that reference site diatom assemblages differ from probabilistic sites.

Sea Level Rise Effect on Massachusetts**

Randolph Mogren, Kristi Kote

Faculty Advisor: William J. Hansen, Ph.D.

Sea level rise is a major concern that threatens infrastructure and populations. This project will focus on the coastal communities of Massachusetts. We will analyze different sea level rise models, census data, elevation, and infrastructure. Once our data is added, we expect that areas at or below sea level will be lost, and with our poster we can demonstrate that the coast is vulnerable to sea level rise and climate change.

History Change of Worcester State Through GIS Mapping**

Sara Penniman

Faculty Advisor: William J. Hansen, Ph.D.

The presentation depicts land use change of the previous and current locations of Worcester State University through the means of geographic information systems (GIS) mapping, the archives department, and field work by using geo-referencing points. Overlays of older maps to current maps enabled a sight of change.

Fossil Fuel Storage Tanks and Freshwater Resources in Worcester County⁺⁺

Leah Stanley

Faculty Advisor: William J. Hansen, Ph.D.

Petroleum contamination in water resources poses problems for the environment and human health. This results from the proximity of fossil fuel storage tanks in relation to water resources. Worcester County is a densely populated area that uses freshwater reservoirs as drinking water sources. Using GIS, the risks of water contamination were evaluated with Massachusetts Department of Environmental Protection regulated drinking water.

GEOGRAPHY AND EARTH SCIENCES

Traffic Citation Comparison: Roxbury vs. Boston Traffic Citation Data⁺⁺

Pierre Aubin, Abena A. Asafo-Adjaye

Faculty Advisors: William J. Hansen, Ph.D., Mary S. Fowler, Ph.D.

Records show that compared to the city of Boston, the town of Roxbury, Mass., has a higher number of traffic stops and citations. The majority of the tickets that are issued indicate a trend of racial profiling, which mostly affects the African-American and Hispanic populations. The data that concerns the ethnicity of violators will be compared to that of the city of Boston.

Impacts of Eurasian Milfoil on Hamilton Reservoir

Joe Dusza, Joe Locatell

Faculty Advisor: William J. Hansen, Ph.D.

Our study will assess the impacts of Eurasian Milfoil on Hamilton Reservoir and the Quinebaug River in the vicinity of Holland, Massachusetts. Using historical records, we will construct maps of the past and current extent of this invasive plant and analyze potential mitigation techniques.

Sustainable Agriculture: What Does the Future Hold?⁺⁺

Ilia Tanto

Faculty Advisor: Douglas E. Kowalewski, Ph.D.

Have you ever thought about food? Who hasn't? After all, we all need food to survive. But have you thought about where your food comes from, and how it is grown? In the United States, there are many forms of agriculture, the two most prominent being industrial and sustainable agricultures. Currently there is a need for more sustainable agriculture in order to get our food without hurting the environment.

HEALTH SCIENCES

Evaluating Dietary Intake: A Comprehensive Evaluation of Fruit Consumption and the Effects of External Cues⁺⁺⁺

Jonathan Frye, Olivia Guilmette

Faculty Advisor: Mariana Cecilia Calle, Ph.D.

Approximately 64 percent of Worcester State University students consume only one to two servings of fruit and vegetables per day, instead of the recommended five servings. This study aims to evaluate the adequacy of the dietary intake of a group of WSU students and implement an evidence-based strategy to improve student consumption in the WSU dining halls.

Obesity Prevalence and Parents' Perceptions of Eating Behaviors in Children with Autism Spectrum Disorder (ASD)⁺⁺⁺

Olivia Guilmette, Julia Bagarella

Faculty Advisors: Mariana Celia Culle, Ph.D., Kristina A. Curro, Ph.D.

Children with autism spectrum disorder (ASD) are two times more likely to be obese, resulting in a prevalence of 31.8 percent. The purpose of this cross-sectional study is to assess obesity prevalence, food selectivity, and sensory-over responsivity in ASD children ages three to eight years-old within the Worcester and Hampshire counties. We will also evaluate the eating habits among these children that may be associated with obesity.

HISTORY

Fears of the New England Colonists**

Kathryn Collins

Faculty Advisor: Erika Briesacher, Ph.D.

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

In colonial New England, there was no shortage of things to fear, all of which are fairly well known: incurable diseases, famines, droughts, Native Americans, nature, and wild animals; however, there were also fears of the paranormal, such as witches, vampires, death, and God. In this presentation, I will delve deep into what the Puritans feared the most and explain why and where it originated.

World War I Biography Project*

Zachary Washburn

Faculty Advisor: Erika Briesacher, Ph.D.

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

April 6, 2017, marks the centennial anniversary of the United States' involvement in World War I. To go along with this anniversary, adjunct professor Linda Hixon is leading a project of writing the biographies of the 355 men and women from the city of Worcester, Mass., who died during "the Great War" and who are commemorated at the Worcester Memorial Auditorium in Lincoln Square.

MATHEMATICS

Cryptography

Sonila Ametaj

Faculty Advisor: Michael Winders, Ph.D.

The field of cryptography studies and practices the techniques used to encode and decode secured information. In this presentation, I will explain how cryptography is based on mathematical theory and computer science, and how symmetric-key and public-key cryptography are used to encrypt and decrypt information.

Taxicab Geometry

Danielle DeRose

Faculty Advisor: Maria Fung, Ph.D.

Funding Source: WSU Faculty Mini-Grant

My goal of this project is to deepen the understanding of people's knowledge about a non-Euclidean geometry known as Taxicab geometry. I will explore the similarities and differences of triangle congruences as well as properties of triangles in both Euclidean and Taxicab geometry. With these comparisons, one will be able to see how certain geometric concepts that are learned in high school will change in Taxicab geometry.

Mathematics of Serial Crime

Emily Doucette

Faculty Advisor: Maria Fung, Ph.D.

Serial crimes capture the attention of the public along with the valuable resources of police forces. This project looks at a formula developed by Kim Rossmo, the creator of the field of geographic profiling. The formula takes the input and provides a jeopardy surface that serves as a likelihood grid of where an offender's residence is, which is used in police investigations to narrow down their suspect list.

The Effects of Self-Driving Vehicles on Auto-Insurance Markets

Colin Duarte

Faculty Advisor: Maria Fung, Ph.D.

Funding Source: WSU Faculty Mini-Grant

Self-driving technology will shortly become a prominent feature in our everyday lives. This project is an exploration via probability and statistics into the effects that self-driving vehicles will have on auto-insurance markets.

The Product of Primes is Prime

Alison Feeney-Patten

Faculty Advisor: Maria Fung, Ph.D.

Prospective teachers frequently express anxiety and resistance to teaching mathematics. Many of them also have similar mathematical misconceptions. This project studies the benefits of training, tutoring, and micro-teaching for prospective teachers as they confront these misconceptions and build their confidence.

Climbing Shoe Efficiency

Cloe Fitzgerald, Clara Gatsios, Sonila Rredhi

Faculty Advisor: Tim Antonelli, Ph.D.

Serious rock climbers swear by brand-name rock-climbing shoes that claim to help with overall performance. We challenge this assumption by testing these shoes against tennis shoes. Our experiment tests subjects with different abilities and backgrounds. We assessed the effects of each type of shoe on climbs of varying difficulty, and created a regression model to determine the correlation between footwear and climbing performance.

RSA Encryption

Clara Gatsios

Faculty Advisor: Michael Winders, Ph.D.

The RSA Encryption algorithm was created to encrypt and decode messages asymmetrically by using public and private keys. A user of RSA shares a public key, which is the product of two prime numbers and an auxiliary value, but does not share the value of those two prime numbers. In this project, we will show how to mathematically decode a message received in this type of encryption.

RSA Encryption

Amanda Lacopo

Faculty Advisor: Michael Winders, Ph.D.

RSA encryption is designed to allow people to use encryption, and decryption, on messages sent via computer. Most people don't even realize that RSA encryption affects them every day and that the majority of websites use RSA encryption because it helps them protect people's personal information. My project involved encrypting a quote that one of my classmates would then have to decrypt.

Modeling the U.S. Water Supply

Patrick Murray

Faculty Advisor: Maria Fung, Ph.D.

The United States holds approximately 8 percent of the entire world's freshwater supply, but we use that water recklessly. In this project, we took into account the amount of water used per person, as well as that used by industry, by agriculture, by irrigation, and by thermoelectric power to develop a model that could predict just how long we can stretch our current water supply, assuming that population growth remains constant.

Mathematics and Music

Ronaldo Negrini

Faculty Advisor: Maria Fung, Ph.D.

This work will depict some of the relationships between mathematics and music. It is intended to analyze the construction of musical scales, among them the Pythagorean Scale, which is based on integer numbers, and the Tempered Scale, which is based on the concept of geometric progression. In addition, a brief study was done on the parameters of sound and its graphic representation through periodic functions.

The Parking Lot Problem

Ronaldo Negrini, Evangelos Gatsios

Faculty Advisor: Tim Antonelli, Ph.D.

We will show how a paved parking lot that measures 100 ft. by 200 ft. can be designed while aiming for maximum efficiency and space. We will depict the advantages and disadvantages of positioning the stalls at different angles, and also consider the benefits of one-way traffic versus two-way traffic. We will be using optimization techniques to determine the angle of a parking stall that uses the optimal amount of space.

Group Theory and the Quantum World

Shaun Nystrom

Faculty Advisor: Michael Winders, Ph.D.

This project explores one of the many fundamental relationships between abstract mathematics and physics: the application of group theory as it pertains to quantum mechanics. We begin by reviewing both separately at an introductory level and then delve into the application of groups to the quantum world. From this, we introduce the audience to the fruitfulness of pure mathematics as it pertains to our immediate reality.

Sabermetrics and Linear Regression to Determine Most Valuable Player from Contract Value

Nakul Patel

Faculty Advisor: Hansun T. To

My project uses multilinear regression to statistically evaluate each baseball player's value and determine which batter and pitcher had the most productive 2016 MLB season.

High School GPA and College Success

Drew Simeone

Faculty Advisor: Maria Fung, Ph.D.

High school grade point averages (GPAs) are one of the major factors that are considered in college entry. Taking data of more than 2,600 students at Worcester State University over three semesters, I analyzed the correlation between the reported high school GPA and subsequent college GPA. My hypothesis followed a common line of thinking: The better a student performs in high school, the better he or she performs in college.

Mathematics of Sudoku

Celine Tran

Faculty Advisor: Maria Fung, Ph.D.

A Commonwealth Honors Project

From solving strategies to identifying how many unique boards exist, the puzzle game Sudoku has many mathematical elements that combine logic, combinatorics, graph theory, and much more. This project explores the application of logic that one uses to solve any Sudoku puzzle, calculating the number of unique Sudoku boards that exist, and also methods of how to create a Sudoku board.

NURSING

Growth of and Disease Caused by the Bacterium *Pseudomonas aeruginosa*

Olivia Antonelli, Liang Dzindolet, Grady Harris

Faculty Advisor: Roger S. Greenwell, Ph.D.

A Commonwealth Honors Project

This project is a continuation of the previous CHIP competition among the students enrolled in BI-206: Medical Microbiology. Our presentation will identify structural and functional characteristics of the bacterium *Pseudomonas aeruginosa*, and describe the pathogenicity of the organism and treatment options against it. The winning team will be given a donation in its name to the foundation of its choice.

Growth and Disease Characteristics of the Bacterium *Yersenia pestis*, a.k.a. "The Plague"

Kaila Bavin, Mallory Breen, Katelyn Stevens

Faculty Advisor: Roger S. Greenwell, Ph.D.

A Commonwealth Honors Project

This project is a continuation of the previous CHIP competition among the students enrolled in BI-206: Medical Microbiology. Our presentation will identify structural and functional characteristics of the bacterium *Yersenia pestis* as well as describe the pathogenicity of the organism and treatment options against it. The winning team will be given a donation in its name to the foundation of its choice.

Paternal Postnatal Depression: The Role of the Nurse

Danielle Bavoux

Faculty Advisor: Paula Bylaska-Davies, Ph.D.

In the postpartum period, a father may face sleep loss, withdrawal, and sadness, which can be identified as characteristics of Paternal Postnatal Depression (PPND). Intervention can improve nursing care as PPND affects 14 percent of fathers in the United States (Paulson, 2010).

Reducing CAUTI

Joshua Bolduc, Joann Morrison, Arlind Dervishaj

Faculty Advisor: Kimberly Silver-Dunker, DPN, R.N.

Too frequently, urinary catheters are implemented in the health-care setting, resulting in the largest rates of infection for hospital-associated illnesses. But are there ways to implement practices to reduce the rates of catheter-associated urinary tract infections?

Growth and Disease Characteristics of the Bacterium *Borrelia burgdorferi*, the Causative Agent of Lyme Disease

Caitlyn Dowd, Rachel Stier, Ayeh Tante

Faculty Advisor: Roger S. Greenwell, Ph.D.

This honors program project is a continuation of the previous CHIP competition among the students enrolled in BI-206: Medical Microbiology. Our presentation will identify structural and functional characteristics of the bacterium *Borrelia burgdorferi*, as well as describe the pathogenicity of the organism and treatment options against it. The winning team will be given a donation in its name to the foundation of its choice.

The Influence of Shaken Baby Syndrome Education on Parents and the Community

Megan Milliken

Faculty Advisor: Paula Bylaska-Davies, Ph.D.

Shaken Baby Syndrome (SBS) is a common type of physical abuse that can be inflicted onto infants by parents and caregivers. A literature review was conducted to evaluate and understand current research on the education programs that were created to raise awareness and prevention of SBS.

Multi-Modal Approach in Post-Operative Pain Relief in School-Aged Children

Olivia Ripa

Faculty Advisor: Paula Bylaska-Davies, Ph.D.

Pain is usually controlled using a pharmacological method, but when treating children, this approach is not effective. Research suggests that a multi-modal approach is the best practice in treating post-operative pain in children. This approach accounts for the psychological aspects of pain in conjunction with the physical aspects. Education on this approach is the focus of this research project.

NURSING - COMMUNITY AND PUBLIC HEALTH**How Communication Disparities Affect Patient Adherence to a Massachusetts DSME Program**+**

Amelia DiDomenico-Houghton, B.S., M.S., BSN, R.N., MSN(c), Nicole Parent, B.S., R.N., CDE, Gregory Shuler, M.S., RN-BC

Faculty Advisor: Greg Shuler, M.S., RN-BC*Funding Source:* The Dr. Stephanie Chalupka Innovation in Research Grant

Diabetes is a costly chronic illness that requires self-management. As such, a Leominster hospital offers a diabetes self-management education (DSME) program for Worcester County residents. A lack of an electronic health records system creates communication disparities, and the hospital is unable to obtain actionable data to facilitate personalized patient care plans and follow-up. This leads to low patient adherence to the program and unsuccessful outcomes.

Development of a Health Promotion Program - Targeting Adolescent Behaviors and Attitudes Toward Prescription Opioids***

Amelia DiDomenico-Houghton, B.S., M.S., BSN, R.N., MSN(c), Ruth Mori, BSN, R.N., MSN(c), Leopold-Negron Cruz, B.A., ME(c), Michelle Riley, BSN, R.N., MSN(c), Melissa M. Silverman, BSN, R.N., MSN(c), Nancy Brewer, Ph.D.

Faculty Advisor: Nancy Brewer, Ph.D.

A health promotion program for adolescents was developed in response to the Massachusetts opioid addiction crisis. The innovative eight-week middle school-based program, Promote Opioid Prevention Program 4 Youth (POPPY), would be implemented during health and wellness classes. The POPPY health promotion program will provide education that leads to the development of health-related decision-making skills.

Implications of Community Support on Breastfeeding Exclusivity*

Angela Latter

Faculty Advisor: Greg Shuler, M.S., RN-BC

Breastfeeding exclusivity up to one year has been identified as an optimal form of infant nutrition by the American Academy of Pediatrics and offers health benefits to infants and their mothers. This study evaluates the comparison of post-discharge community support to identify programs which promote and increase breastfeeding exclusivity. Identifying effective program structures will help increase exclusivity.

Hand Hygiene: The Basis of Infection Control*

Keisha McPherson

Faculty Advisor: Greg Shuler, M.S., RN-BC

Of all medical interventions, hand hygiene remains the most effective and least costly way to prevent health care-associated infections (HAIs). Based on available research, major factors for noncompliance include general risk, personal risk, and emotional barriers. Compliance initiatives include multi-modal hand hygiene campaigns, hand hygiene auditing, and increasing hand hygiene education among health care workers.

2016 Massachusetts Public Health Nursing Survey*

Ruth Mori, BSN, R.N., MSN(c)

Faculty Advisor: Greg Shuler, M.S., RN-BC

In 2016, the Massachusetts Association of Public Health Nurses (MAPHN) conducted a voluntary electronic survey. A total of 142 surveys were returned with respondents indicating they have worked in public health for six to 10 years (21 percent) and are planning to retire in 10 years or later (34.5 percent). Data collected will help identify future trends and contribute to national public health nursing (PHN) workforce data.

Opioid Education and Prevention*

Michelle Riley, R.N.

Faculty Advisor: Greg Shuler, M.S., RN-BC

Our country is in the midst of a public health crisis because of opioid-related deaths. Treatment for opioid addiction can help save lives, but the key to reducing opioid-related deaths is prevention. Substance use in adolescence leads to a greater risk of opioid addiction among young adults. Education about the dangers of opioids is essential to prevent misuse.

Strategies and Challenges for Provision of Youth-Friendly Health Services*

Melissa M. Silverman, BSN, R.N., MSN(c)

Faculty Advisor: Greg Shuler, M.S., RN-BC

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

Adolescence (ages 10-24 years) is a critical life stage that brings complex challenges with a potential for life-long health implications. Examining the upstream social determinants of health guides the strategic planning process. Through a literature review and focus groups, recommendations on how to provide youth-friendly health services are presented with the goal to promote access to care and healthy youth development.

Childhood Obesity*

Misty Wisuri

Faculty Advisor: Greg Shuler, M.S., RN-BC

Studies show that the rates of childhood obesity have tripled and that being overweight leads to chronic health issues such as Type II diabetes. Prevention is key to the management of this epidemic. Programs that initiate education as well as lifestyle interventions with behavior modifications have been shown to be successful, and can be school-based, family-based, and government-based with help from public policy.

NURSING – NURSE EDUCATOR

Respiratory Syncytial Virus Bronchiolitis: Maintaining Hydration During Acute Illness*

Anne Weaver

Faculty Advisor: Paula Bylaska Davies, Ph.D.

Respiratory Syncytial Virus (RSV) bronchiolitis is the most common cause of hospitalization for infants. One third of these patients require peripheral PIV catheter placement, which is rated by parents as the second most distressing event during hospitalization. The research question to be answered is whether infants hospitalized with RSV bronchiolitis require PIV placement or if the infants can be supported with the use of a gastric tube.

OCCUPATIONAL THERAPY

The Factors that Lead to the Decision to Place a Loved One with Alzheimer's Disease or Related Dementia into a Long-Term Care Facility*

Megan Allen, OT/s

Faculty Advisor: Joanne Gallagher-Worthley, Ed.D., OTR/L, CAPS

The purpose of this study was to understand the caregiving experience of individuals who provide informal care for loved ones with Alzheimer's disease or related dementia (ADRD). The reasons for the placement of loved ones with ADRD into a long-term care (LTC) facility by informal caregivers, the challenges that are experienced, and supports utilized throughout the process were investigated.

Adult Day Health Centers: Caregivers' Perceptions*

Emily Beaudoin, OT/s

Faculty Advisor: Joanne Gallagher-Worthley, Ed.D., OTR/L, CAPS

The purpose of this study was to further identify caregivers' perceptions and the positive aspects of adult day health centers (ADHC). The findings are intended to allow ADHC to realize how well the services and programs benefit and match the needs of both the client and the caregiver.

The Student Athlete Perspective on the Implementation of Performance Patterns*

Molly Downing, OT/s

Faculty Advisor: Joanne Gallagher-Worthley, Ed.D., OTR/L, CAPS

The purpose of this study was to determine how collegiate student athletes maintain effective performance patterns and their effect on satisfaction with the college experience.

The Influence of Popular Computer Activities on Musculoskeletal Pain and Computer Ergonomics*

Julia Eliopoulos, OT/s

Faculty Advisor: Joanne Gallagher-Worthley, Ed.D., OTR/L, CAPS

The purpose of this study was to determine how participation in different computer activities impacts proper ergonomics and resulting musculoskeletal pain. The findings of this study were intended to further advance professional knowledge about the need to make recommendations that are computer activity-specific.

Outdoor Physical Activity and Life Satisfaction of College Students*

Kristi Goodman, OT/s

Faculty Advisor: Joanne Gallagher-Worthley, Ed.D., OTR/L, CAPS

The purpose of this study was to explore the relationship between outdoor physical activity and life satisfaction, and to determine if there was a positive connection between the two factors.

Contribution of Leisure Activities to Quality of Life in Older Adults*

Angela Grasseti, OT/s

Faculty Advisor: Joanne Gallagher-Worthley, Ed.D., OTR/L, CAPS

The purpose of this study was to see how engagement in leisure activities contributed to a greater quality of life in older adults by examining the positive benefits of participating in leisure activities, the effect of participation as it differs based on amount and involvement, and the effects that leisure activities have on quality of life related to marital status.

Factors that Influence Elementary Educators' Use of Sensory Strategies in the Classroom*

Leanne Holland, OT/s

Faculty Advisor: Joanne Gallagher-Worthley, Ed.D., OTR/L, CAPS

The purpose of this study was to identify the factors influencing elementary educators' use of sensory strategies in the classroom and to investigate how teachers perceive the strategies' effectiveness.

Understanding Quality of Life After Completing a Multiple Sclerosis Wellness Program*

Alyssa King, OT/s

Faculty Advisor: Joanne Gallagher-Worthley, Ed.D., OTR/L, CAPS

The purpose of this study was to acquire a deep understanding about how participants' quality of life (QOL) was affected after completing a multiple sclerosis (MS) wellness program. This qualitative research study had the student investigator complete six semi-structured interviews with the participants. The findings of this study showed that people with MS may feel an improvement in QOL after completing a wellness program.

Lifestyle Changes after Retirement: Effect on Self-Perceived Health and Life Satisfaction*

Emily Krasowsky, OT/s

Faculty Advisor: Joanne Gallagher-Worthley, Ed.D., OTR/L, CAPS

The retired population continues to grow as life expectancies rise and the Baby Boomer population enters this stage of life. It is important to determine ways in which health care professionals and the community can assist this population to lead the most satisfying and healthy lifestyles as possible in order to decrease health care burdens and increase the overall quality of life for this growing population.

Parental Knowledge of Sports-Related Concussions*

Kayla Lombardi, OT/s

Faculty Advisor: Joanne Gallagher-Worthley, Ed.D., OTR/L, CAPS

The purpose of this study was to determine the current knowledge base of parents of student athletes in regards to concussive injuries, including symptom recognition, management, and return-to-play guidelines.

Parents' Experience of Learning to Functionally Communicate Through the Use of Their Child's Non-Verbal Communication System or Device*

Danielle Paquin, OT/s

Faculty Advisor: Joanne Gallagher-Worthley, Ed.D., OTR/L, CAPS

The purpose of this study was to explore parents' perceived experience of learning to functionally communicate with their child while using their child's non-verbal communication device or system.

Effects of Fear of Falling on Participation in Instrumental Activities of Daily Living*

Emily Rasid, OT/s

Faculty Advisor: Joanne Gallagher-Worthley, Ed.D., OTR/L, CAPS

The purpose of this study was to examine the relationship between the fear of falling and participation in instrumental activities of daily living (IADLs). The findings from this study were intended to help occupational therapists address the fear of falling and prevent activity restriction in community-dwelling elders.

Parents' Perspectives on Home Modifications for Children with Cerebral Palsy*

Amanda Rayos, OT/s

Faculty Advisor: Joanne Gallagher-Worthley, Ed.D., OTR/L, CAPS

The purpose of this study was to discover the true feelings that parents have toward home modifications for their children with cerebral palsy. A qualitative design was utilized to look at the impact that home modifications had on the children's participation, financial expenditures, and the overall impact on the family.

Inclusion of Adolescents with Disabilities in Typical Driving Education Programs*

Taylor Shaver, OT/s

Faculty Advisor: Joanne Gallagher-Worthley, Ed.D., OTR/L, CAPS

The purpose of this study was to determine if it is appropriate to include teenagers with disabilities in typical driving education programs through the perceptions of driving instructors.

Effects of Adult Coloring Groups on Well-Being*

Megan Shepard, OT/s

Faculty Advisor: Joanne Gallagher-Worthley, Ed.D., OTR/L, CAPS

The purpose of this study was to determine if there was an impact on well-being for adults who attended coloring groups in their community. The results intend to provide occupational therapists with a tool to offer clients that will increase participation and well-being.

The Effects of Musculoskeletal Pain in Childcare Workers*

Casey Taillon, OT/s

Faculty Advisor: Joanne Gallagher-Worthley, Ed.D., OTR/L, CAPS

This quantitative study addressed the effects of musculoskeletal pain in the profession of childcare workers by finding the prevalence of pain, where the site of pain was located, how the length of time working contributed to pain, and what activities also contributed to pain.

The Effects of Fatigue on Daily Occupations of People with Multiple Sclerosis*

Corie Travis, OT/s

Faculty Advisor: Joanne Gallagher-Worthley, Ed.D., OTR/L, CAPS

Fatigue has been identified as one of the most disabling and severe symptoms of Multiple Sclerosis (MS); however, its effect on one's daily life is somewhat unclear. Semi-structured interviews were conducted with six individuals living with MS, with a goal of describing how MS-related fatigue impacts certain occupations and activities in the participants' daily lives.

PHILOSOPHY

Precisionism: A Brief History and Comparative Application of Kant's and Collingwood's Aesthetic Philosophies****

Elizabeth Lea Bridleman

Faculty Advisor: Henry C. Theriault

This paper considers the early 20th century artistic movement of Precisionism through the sharply differing aesthetic theories of Immanuel Kant and R.G. Collingwood. It argues that the movement was consistent with Kant's theory, while application of Collingwood's "The Principles of Art" points to the movement's flaws and perhaps a reason for its end.

Philosophical Approaches to Language Use by Bilingual Students****

Catherine A. Bulikowski

Faculty Advisor: Henry C. Theriault

This paper applies key philosophical concepts of language use from phenomenology and post-modernism, especially Gilles Deleuze and Felix Guattari's "Kafka: Toward a Minor Literature", to the experiences of bilingual students in the Worcester State University Writing Center. The paper argues that, contrary to usual expectations, bilingualism can support innovative language use in English.

Election 2016: Philosophical, Economic, and Political Approaches to the Complexities Beneath the Surface****

Katie Commerford, Karen Huu, Nicholas Wurst

Faculty Advisor: Henry C. Theriault

In this student panel discussion, Katie Commerford considers the Electoral College's fairness and explores alternatives; Karen Huu argues that journalists valuing traditional political rhetoric failed to appreciate candidate Trump's communicative effectiveness; and Nicholas Wurst analyzes the election as a reflection of broader forces in liberal capitalist societies, where competing candidates actually reinforce the same core agenda.

Phenomenologies of Religious Beliefs****

Kennedy M. Demoah

Faculty Advisor: Henry C. Theriault

This paper examines religion through the phenomenological frameworks of Edith Stein, Franz von Brentano, and Martin Heidegger. It argues that, contrary to usual claims that empiricist-tending philosophies such as phenomenology cannot be applied to the content of religious beliefs, the work of these three philosophers offers important insights into key religious notions.

Exploring and Defining Black Identity in America Today****

Elijah Grant

Faculty Advisor: Henry C. Theriault

Through phenomenological and existentialist philosophical concepts, especially from black existentialism, this paper takes up the question of whether it is possible to identify a defining essence of black identity in the United States. The paper argues that any black identity has external determinants that undercut claims of an essence, and develops a concept of black identity that fits within this complex framework.

Inhibition of Nuance in a "Fast-Food Facts" World**

Ryan Porter Lindsay

Faculty Advisor: Henry C. Theriault

This paper uses phenomenological philosophical analysis to analyze the effects of over-provision and over-consumption of information in a digital world on cognitive processes. It argues that increased information has counterintuitively driven a narrowing of thought into simplistic dichotomies that do not support the subtle arguments necessary to proper understanding of complex contemporary issues.

PH 290: The Philosophy of Art – Final Creative Projects as Illustrations of Aesthetic and Creativity Theories****

Students of PH 290: The Philosophy of Art

Faculty Advisor: Henry C. Theriault

Funding Source: Worcester Art Museum

The students in this course studied various historical and contemporary aesthetic and creativity theories. Their final project was to produce original creative projects that illustrated elements of the theoretical work they studied. The products of their work along with statements about them and explanations of the geneses of their projects will be displayed, along with students available for further discussion.

PSYCHOLOGY

Attitudes Toward Disability Across the Lifespan

Jessica Antonio, Mary Schmutte

Faculty Advisor: Nicole Rosa, Ph.D.

Funding Source: WSU Faculty Mini-Grant

People with disabilities comprise one of the largest minority groups in the United States, impacting young and old alike. It is important to understand how attitudes toward disabilities are formed in order to identify potential interventions to decrease issues related to prejudice and discrimination toward those with disabilities. The present study explores these attitudes and factors that may impact these people across their lifespans.

Gender Moderates the Mediation Effects of some Repetitive Negative Thinking in the Relations Between Neuroticism and Both Stress and Well-Being

Kathryn Fokas, '10, Champika K. Soysa, Ph.D., Jenna Cears, George Dilling

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

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

We studied gendered moderation of self-blame and venting as concurrent mediators in the neuroticism – stress and neuroticism – well-being relations in 189 undergraduates. In the preceding relations, self-blame was a mediator only in women. Venting mediated the neuroticism – stress relationship in both men and women. This poster will be presented at the Association for Psychological Science Annual Conference in May 2017.

An Examination of Spatial Relations in Science Category Learning

Monica Greenlaw, Jessica Wilding

Faculty Advisor: Benjamin D. Jee, Ph.D.

This study examined visual science category learning. Images of high or low similarity were viewed, and new images were classified. Similar contrasts improved classification of images that had the same spatial layout as the learning ones, but led to poor classification of different layouts. Responses suggest that similar contrasts led to focus on spatial relations, while dissimilar contrasts drew attention to features.

How Do Classroom Outlines Impact Comprehension and Metacomprehension?

Katrina Kush, Dylan Foden, Catherine Bergeron

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

Funding Source: WSU Faculty Mini-Grant

Students are not always able to assess their learning and be cognizant of what they understand. Previous research has found discrepancies between what students think they know and what they actually retain. Outlines have been shown to improve both comprehension and metacomprehension. We will present findings further exploring how different outline formats influence learning.

Spatial Thinking and Relational Scaffolding (STARS) in Elementary Space Science Learning**

Katelyn Norsworthy, Katrina Piangerelli

Faculty Advisor: Benjamin D. Jee, Ph.D.

Children have difficulty integrating observations of the sky (Earth-based perspectives) with a scientific model of the solar system (space-based perspectives). The present study tested whether comparisons between perspectives help students understand the day/night cycle. The results suggest that comparison supports relational learning in space science, especially for children who struggle with spatial thinking.

Incorporating the Institutional Vision into the [remastered] Gallery at the Worcester Art Museum

Leonardo Quezada, Amy Cota-McKinley, Ph.D.

Faculty Advisor: Amy Cota-McKinley, Ph.D.

Funding Source: WSU Faculty Mini-Grant

The purpose of this project was to develop an effective gallery guide for visitors to use in [remastered] at the Worcester Art Museum (WAM) that incorporated the director's vision for the space. Queued visitors were interviewed after they explored the space while using the gallery guide. Results showed that the improved gallery guide increased visitor understanding of why the changes occurred in [remastered] and increased their total time in the gallery.

Gender Moderates the Mediation Effects of some Repetitive Negative Thinking in the Relations Between Neuroticism and Both Depression and Anxiety

Champika K. Soysa, Ph.D., Kathryn Fokas, '10, Stephen McElroy, Andrea Nasiff

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

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

We studied gendered moderation of the mediation effects of repetitive negative thinking in the neuroticism – depression and neuroticism – anxiety relations in 189 undergraduates. In the preceding relations self-blame was a mediator only in women, but venting was a mediator in both men and women. This poster will be presented at the Association for Psychological Science Annual Conference in May 2017.

College Environment Mediates and Gender Moderates the Relations Between Maladaptive Coping and Psychological Outcomes

Champika K. Soysa, Ph.D., Stephen McElroy, George Dilling

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

We examined the mechanisms through which maladaptive coping predicted depression and well-being in college students (N=94). Gender moderated both direct and mediation effects in the associations between maladaptive coping and psychological outcomes. This poster was presented at the New England Psychological Association Annual Conference – October 2016.

Self-Esteem, Generational Status, and LOC in Relation to Stress and Well-Being

Champika Soysa, Ph.D., Andrea Nasiff, Jenna Cears, Stephen McElroy, George Dilling

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

Funding Source: Community Health Improvement Plan (CHIP)

Self-esteem mediated the internality – stress and internality – well-being relations in first- but not continuing-generation college students. Self-esteem mediated the externality – stress and externality – well-being relations in both first- and continuing-generation undergraduates. This poster was presented at the Eastern Psychological Association Annual Conference in March 2017.

SOCIOLOGY

Physical Activity, Mental Health, and Happiness**

Catherine Jreije

Faculty Advisor: Alex Briesacher, Ph.D.

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

The purpose of this study is to see the effects of physical activity on mental health/happiness. The research will help us understand if there is a direct correlation between working out and overall mental health and level of happiness. My hypotheses are that mental health improves when someone is physically active, and that physical activity has a significantly positive effect on someone's level of happiness.

Identity Saliency and Activism in Policy Debate**

Janet Novack

Faculty Advisor: Alex Briesacher, Ph.D.

This research aims to seek correlation of ethnic and academic identity, and explore the relationship between identity saliency and activism in policy debate, an academic form of debate that is research intensive and highly intellectual in terms of public policy, philosophy, and more. Students who participate in policy debate engage in higher-order thinking and develop critical argumentation skills.

Relationship Satisfaction

Anders Svendsen

Faculty Advisor: Alex Briesacher, Ph.D.*Funding Source:* WSU Faculty Mini-Grant

This research explores the differential impact of relationship satisfaction dependent on whether individuals' initial contact was made through an online environment as opposed to physical co-presence. Research is based on a survey drawn from the population of the Worcester State University community.

URBAN STUDIES**Opportunity Awaits: University to Community Partnerships**

Travis Nichols

Faculty Advisor: Alan Gordon

A Commonwealth Honors Project

Worcester has been a hub of creativity for community collaboration, but there is still much to be done. The goal of this project is to research existing links between universities and neighborhoods. The result will be to discover new possibilities, recreate successes, adapt them for Worcester, and develop a range of university partnership implementation recommendations to the local university systems.

VISUAL AND PERFORMING ARTS**Visual and Performing Arts Creative Projects******

Rona Balco, Paris Bourdreau, Midaly Carrasquillo, Aimee Chang, Kimberly Collazo, Kasey Gillen, Nicole Huss-Howland, Shannon Richards, Pamela Saffer, Debbie Tran, Nathen Wheeler

Faculty Advisors: Stacey Parker, Adam Zahler, Michael Hachey, Sam O'Connell, Kyle Martin, D.M.A., Amaryllis Siniosoglou

These 11 thesis students in the Visual and Performing Arts Department will present a summary of their Capstone projects. These projects encompass original music composition, direction of a theatrical work, an original self-directed play, an illustrated children's book, and visual works including an interactive installation, painting, two- and three-dimensional multi-media works, and a digital interactive exhibit.

Almost, Maine* Costume Design*

Jasper Bliss

Faculty Advisor: Susan Johnson-Hood

This exhibition is a showcase of my costume designs for the theater department's recent production of *Almost, Maine*. The designs are based on a central motif of color isolation in order to symbolize the emotional representation of characters in their scenes and in relation to one another. Several of the costume pieces that I constructed will be on exhibit, including a hooded sweatshirt that is of my own design.

Senior Thesis Composition Projects⁺⁺

Casey Evans, Shannon Richards

Faculty Advisor: Kyle Martin, D.M.A

Casey Evans presents her video game creation concept, including literary narrative, accompanying storyboards, a map of the fantasy world setting, and original orchestral music composed for various characters and events in the story. Shannon Richards composed original music for the WSU production of *Almost, Maine*, a play about romance set in Maine. Recordings of music from both senior thesis projects will be presented.

WORLD LANGUAGES - SPANISH

Osteoporosis in Elderly Women

Paige Boure, Julia D'Arcy, Yakaira Gonzales, Ramdal Mendez

Faculty Advisor: Elizabeth Osborne, Ph.D.

Funding Source: WSU Faculty Mini-Grant

Osteoporosis is defined as a debilitating disease that weakens bones and worsens with age, particularly affecting elderly women. Our group visited the Worcester Senior Center and shared our discoveries with the Latino Elders group. Since the group members primarily speak Spanish, our interviews were conducted in Spanish. We discovered ways that women can decrease the effects of osteoporosis through diet, nutrition, and lifestyle changes.

Translation Practice: Building a Community Garden in Worcester

Glennys Fuentes

Faculty Advisor: Antonio Guijarro-Donadiós, Ph.D.

Funding Source: CHIPS in Action

Demand for healthy food options is a rising trend in Worcester, and it is vital that Worcester residents have an ample diet to foster healthy eating habits. With CHIP, the World Languages Department created a start-up brochure on how to add a community garden to the city. Our goal was to make this data accessible in Spanish. SP-327, taught by Dr. Guijarro-Donadiós, enabled me to acquire the skills needed for translating.

Educating the Hispanic Youth: Safe Sex and Birth Control⁺⁺

Karla Travieso, Sara Lesack, Lindsey Tarbox, Dalida Peña

Faculty Advisor: Elizabeth Osborne, Ph.D.

This poster is based off of a project that was developed to inform Worcester youth about the different forms of birth control. Latinos are more affected by teen pregnancy and many are not aware of the resources. We reached out to Ascentria Care Alliance in order to work with the Latino community of Worcester. Our goal is to inform the community of different service providers such as Planned Parenthood and Clearway Clinic.

Women's Mental Health Awareness for the Older Adult⁺⁺

Alexandra Wild, Lauren McCarthy, Yaniz Lopez-Colon

Faculty Advisor: Elizabeth Osborne, Ph.D.

The purpose of this presentation is to promote mental health awareness for older adult Latina women in Worcester. To achieve this goal, we will engage with the Latino population at the Worcester Senior Center and provide education about the cultural stigma surrounding mental health, common mental illnesses and their symptoms, and strategies to effectively cope with the significant changes that occur during the aging process.

Celebration of Scholarship and Creativity

Departmental Liaisons

Biology	Ellen Fynan and Randy Tracy
Business Administration and Economics	Jay Mahoney
Chemistry	Joe Quattrucci
Communication	Dan Hunt
Communication Sciences and Disorders	Suzanne Meyer
Computer Science	Elena Braynova
Criminal Justice.....	Hye-Sun Kim
Physical and Earth Sciences	Bill Hansen
Education.....	Kirby Wycoff
English	Heather Treseler
Health Sciences	Mariana Calle
History and Political Science.....	Martin Fromm
Mathematics.....	Michael Winders
Nursing.....	Paula Bylaska-Davies
Occupational Therapy.....	Jacqueline Brennan
Philosophy	Henry Theriault
Psychology	Champika Soysa
Sociology.....	Francisco Vivoni
Urban Studies	Tim Murphy
Visual and Performing Arts	Catherine Wilcox-Titus
World Languages.....	Antonio Guijarro-Donadiós



Celebration of Scholarship and Creativity Event Contributors

Jillian Anderson

Kim Caisse

Christine Hickman

Dr. Roberta Kyle

Mark LaCroix

Dr. Linda Larrivee

Renaë Lias Claffey

Lisa McCormack

Dr. Russ Pottle

Michael Priest

Nathalie Torres-Serrano

Gerald Sorge

Denise Thomas



WORCESTER
STATE
UNIVERSITY

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