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Celebration of Scholarship and Creativity

April 16, 2014



WORCESTER
STATE
UNIVERSITY

Schedule of Events

POSTER SESSION

1 – 3 p.m.

STUDENT & FACULTY POSTER PRESENTATIONS

May Street Building, Auditorium

ORAL PRESENTATION & PANEL DISCUSSION SCHEDULE

9:30 – 9:45 a.m.

THE WOMEN OF THE BEAT MOVEMENT

Laura Sutter

Faculty Advisor: Tona Hangen, Ph.D.

Foster Room

9:45 – 10 a.m.

A MOTHER'S RIGHT TO LIFE

Tiara Yahnian

Faculty Advisor: Henry Theriault, Ph.D.

Foster Room

9:45- 10 a.m.

STRATEGIC PLAN FOR WORCESTER CENTER FOR CRAFTS:
CREATING AWARENESS, EXPOSURE AND FUNDING FOR
“CARNAVAL” 2014

Daniel Williams, Shyna Trova, Jacob Poplaski, Taryn Lielasus,

Francesca Presti, Kaitlyn Haselton

Faculty Advisor: Emanuel Nneji, Ph.D.

President's Dining Room

10 – 10:15 a.m.

COULD SINGLE-PAYER HEALTH CARE
BE A REALITY IN THE UNITED STATES?

Breeyn Green

Faculty Advisor: Michelle White, Ph.D.

Foster Room

10 – 10:30 a.m.

THE NEED FOR HIGHER EDUCATION AMONG WORCESTER
STATE UNDERGRADUATE STUDENTS: JOBS AND FINANCIAL
SECURITY IN THE 21ST CENTURY

Joseph Phillips, Ryan Miller, Ashley Anthony

Faculty Advisor: Emanuel Nneji, Ph.D.

President's Dining Room

10:15 – 10:30 a.m.

SOCIAL CONSTRUCTION OF CHILDHOOD AND LIFE CHANCES
FOR CHILDREN IN TANZANIA

Rebekah Lizotte

Faculty Advisors: Fortunata Makene, Ph.D., Sonya Conner, Ph.D.

Foster Room

10:30 - 10:45 a.m.

OPTOGENETIC STIMULATION OF THE AUDITORY
CORTICOFUGAL SYSTEM

Maryanna Owoc

Faculty Advisor: Keith Darrow, Ph.D.

Foster Room

11 – 11:15 a.m.

THE UNIVERSAL FIBONACCI SEQUENCE

Jason A. Green

Faculty Advisor: Hy Ginsberg, Ph.D.

Foster Room

11:30 - 11:45 a.m.

ADVOCACY IN THE CAPITAL

Brandy Klaes, Brian Mullen

Faculty Advisors: Carl Herrin & Patrick Hare

Foster Room

11:45 a.m. – 12 p.m.

HAMLET'S HEART OF DARKNESS

Steven Connors

Faculty Advisor: Heather Treseler, Ph.D.

Foster Room

12 - 12:15 p.m.

PURITAN OF THE POST-WAR: JOHN BERRYMAN'S "HOMAGE
TO MISTRESS BRADSTREET" AS A CRITIQUE OF COLD WAR
AMERICA

Christine Hickman

Faculty Advisor: Heather Treseler, Ph.D.

Foster Room

12:30 - 12:45 p.m.

READING THE NON-READER:

HOW STUDENTS WHO DO NOT READ SEE BOOKS

Nick Duffy

Faculty Advisor: Karen Woods Weierman, Ph.D.

President's Dining Room

12:30 – 12:45 p.m.

THE INVISIBLE PEOPLE OF THE 1950s: EXPLAINING THE
CAUSE OF POVERTY DURING PROSPERITY

Jean Cabral

Faculty Advisor: Tona Hangen, Ph.D.

Foster Room

12:45 – 1 p.m.

MEDIA IN SOCIETY BOOK PUBLICATION

Julie Frechette, Ph.D.

Foster Room

12:45 – 1 p.m.

CHOLERA IN WORCESTER: A STUDY OF THE
NINETEENTH-CENTURY PUBLIC HEALTH MOVEMENT

Alan Ira Gordon, Urban Studies Instructor

President's Dining Room

2:30 – 3 p.m.

HONORS STUDENTS REFLECT ON THE WASHINGTON, D.C.,
EXPERIENCE

Debora Dias, Gwendolyn Bois, Tony Caushi

Faculty Advisors: Carl Herrin & Patrick Hare

May Street Building, Classroom 107

Celebrating Academic Excellence in and out of the Classroom

Welcome to the Seventh Annual Worcester State University Celebration of Scholarship and Creativity. This event is a special tradition every spring on our campus, and it has grown in size and in the quality of presentations over the years.

We have always prided ourselves on excellence in the classroom. After all, we have been focused on teaching since we began as Worcester Normal School in 1874. More and more, though, we have recognized the importance of continuing student learning outside of the classroom—in the studio, the laboratory, and the library. Our faculty have greatly increased the work that they do with students on experimental research, on scholarship using primary materials and sources, and in original creative work. This Celebration provides an overview of the dedication, innovation, and intellectual effort of our students, and of our faculty who mentor them, with regard to scholarship, research, and creativity at today's Worcester State University.

As you walk from presentation to presentation, you will see and hear genuinely impressive student learning outcomes from across the academic disciplines—from the natural and social sciences to the arts and humanities—in the form of posters, critical papers, panel discussions, and performances. Please enjoy this 2014 commemoration of, and salute to, the scholarly and creative accomplishments of our faculty and students.



Charles Cullum, Ph.D.
Provost and Vice President for Academic Affairs



WORCESTER
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BIOLOGY

THE RATE OF BIOFILM MIGRATION BY STAPHYLOCOCCUS EPIDERMIS ON MEDICAL GRADE MATERIALS

Kimberly Mohareb

Faculty Advisor: Ellen Fynan, Ph.D.

Bacterial infection due to catheter use is a widespread issue in clinical settings worldwide. Bacteria are able to maintain a persistent infection in part through the process of biofilm formation. Studying the organism's ability to form biofilms on catheters is necessary to discovering novel methods of reducing patient infections. In this study, the rate of migration of Staphylococcus epidermis on several medical grade materials was observed. By using sections of tubing as bridges for the organism to migrate across, we were able to stamp the pieces on agar plates at different time points to measure the distance the organism migrated. It was determined that of all the materials tested, Teflon® tubing appeared to be the most effective in minimizing the rate of biofilm migration. Further studies should be conducted regarding more accurate measurements of biofilm migration rates as well as observations of the magnitude of biofilm formation on these materials.

ANALYZING THE DISTRIBUTION AND ABUNDANCE OF SYLVILAGUS FLORIDANUS AND S. TRANSITIONALIS IN SOUTHERN NEW ENGLAND

Deanna Lavoie, Megan Botti-Marino, Felicia Macnicol, Joseph Devereaux

Faculty Advisor: Randall Tracy, Ph.D.

The New England cottontail rabbit (*Sylvilagus transitionalis*; NEC) is a species of special concern in Massachusetts and is a candidate for the Federal Endangered Species List. Its distribution and abundance have steadily declined, but have gone understudied. This decline appears due to decreased habitat and competition with the invasive eastern cottontail (*S. floridanus*; EC). No data exist for possible remnant populations of NEC in Worcester County. This group of undergraduates conducted field research on cottontails to 1) locate remnant populations of NEC and 2) ultimately explain the competitive interactions between these species. Sample sites were monitored for rabbit activity through the winter of 2013-2014. Samples of fecal pellets were collected from focal study sites (with GPS coordinates) for DNA analyses in collaboration with the Massachusetts Division of Fisheries and Wildlife and University of Rhode Island. This work was coupled to mark-recapture studies throughout eastern Connecticut that ultimately will gather data important to conservation decisions regarding the NEC.

A SPATIAL ANALYSIS OF TREE SPECIES ON THE WORCESTER STATE UNIVERSITY CAMPUS

Deanna Lavoie, Megan Botti-Marino, Felicia Macnicol, Joseph Devereaux

Faculty Advisor: Randall Tracy, Ph.D.

The Tree Campus USA initiative, sponsored by the Arbor Day Foundation, was established to promote the study of and appreciation for university campus trees. The Worcester State University campus has been deemed a good candidate for this initiative because it offers a variety of native and ornamental trees that can be identified and cataloged by biology students. Conducting surveys and inventories of campus tree species can provide important information to community organizations regarding species distributions, including endangered species. Beginning in the fall of 2013, four WSU students cataloged trees on the campus as part of the Tree Campus USA initiative. GPS coordinates of each tree were recorded, and trees and their distributions were identified. This effort will continue with the labeling of trees, with the ultimate goal of creating a walking tour of the campus trees.

INVESTIGATIONS IN WILDLIFE CONSERVATION: QUANTIFYING ANIMAL DIVERSITY IN WORCESTER COUNTY

Joseph Devereaux

Faculty Advisor: Randall Tracy, Ph.D., Steven Oliver, Ph.D.

Wildlife conservation was explored through the areas of head-starting hatchling northern red-bellied cooters (*Pseudemys rubriventris*) and through live-trapping to identify mammal species diversity and show the distribution and abundance of

the endangered Southern bog lemming (*Synaptomys cooperi*) in Worcester County. Filtration design was explored and an operational filter was constructed for use in the captive care of the young turtles until their spring release. Sherman live traps were deployed in and around the bog at Poutwater Pond in Holden, Mass. While these live traps failed to capture any Southern bog lemmings, these efforts allowed insight into the small mammal diversity of the area.

MUTATIONAL ANALYSIS OF CDK MEDIATED PHOSPHORYLATION SITES IN THE *S. CEREVISIAE* BUD SITE SELECTION PROTEIN BUD3

Bharat B. Hans, Angeline E. Cloutier, Alyssa V. Geddis
Faculty Advisor: Jennifer Hood-DeGrenier

In the budding yeast, *Saccharomyces cerevisiae*, genetic programs specify the selection of a new bud site: either a monopolar-axial pattern for haploid cells or a bipolar pattern for diploid cells. Bud3 is specifically required for the axial budding pattern. Prior studies have identified at least three amino acids in Bud3 that are subject to cell cycle-specific phosphorylation by cyclin-dependent kinases (CDKs). We are investigating whether CDK-dependent phosphorylation of Bud3 is important for axial budding by site-directed mutagenesis. Mutation of any one of the phosphorylation sites to alanine (rendering those sites non-phosphorylatable) caused minor defects in axial budding; we are now investigating the effects of mutating those sites to acidic residues, which mimic permanent phosphorylation, as well as combinations of mutations. This may serve as a general model for understanding the biochemical mechanisms that specify cell polarity and the significance of phosphorylation in linking cell cycle progression to cell polarity establishment.

BIOTECHNOLOGY

BIOCOMPATIBILITY TESTING USING *STAPHYLOCOCCUS EPIDERMIDIS* (ATCC 35984) GROWING ON POLYAMIDE AND Co POLYESTER POLYMERS FILLED WITH MONTMORILLONITE NANOPARTICLES

Mehrnaz Sadrolashrafi
Faculty Advisor: Peter Bradley, Ph.D., Ellen F. Fynan, Ph.D.

It has been seen that presence of nanoparticles in plastics promotes the growth of VERO cells on them. (VERO cells are an African Green Monkey kidney cell line.) This research is focused on behavior of bacterial cells in presence of nanoparticles in plastics. Substrates were incubated at 37°C for 24 hours in Tryptic soy broth medium containing *Staphylococcus epidermidis*. Using alamarBlue, change in color of each solution was studied by recording the absorbance at 570 nm. The absorbance was then converted into colony forming units adhered to each substrate using the standard growth curve established earlier. As alamarBlue assay does not affect the structure of the biofilm formed, pieces were studied using a scanning electron microscope for further analysis. Data collected from this experiment may provide insight about how effective presence of nanoparticles is to the growth of bacterial cells on these substrates and whether or not these pieces can be used in medical devices.

ARTHROPODS FOUND IN GARDEN SOIL EXAMINED WITH THE SCANNING ELECTRON MICROSCOPE

Michael T. Thibault, Caitlyn C. Kearns
Faculty Advisor: Peter M. Bradley, Ph.D.

The ground on which we walk every day consists of a very complex system of biological processes and organisms. One very crucial component of soil is the presence of soil mesofauna, particularly arthropods. The presence of certain soil arthropods can be very helpful in determining a soil's health and also the soil's possible origin. In the lab, a very simple method of extracting these mesofauna was used called the Bursle-Tullgren Funnel technique, which has proven to be very efficient and effective for its purpose. To analyze these tiny organisms once they are extracted, a scanning electron microscope (SEM) was used to observe highly magnified images with great contrast. Using the SEM, we had a very good sense of the structure and morphology of these organisms to classify them and to further understand the soil they came from.

AGROBACTERIUM TUMEFACIENS MUTANTS CREATED THROUGH TRANSPOSON MUTAGENESIS

Sharine Elliot

Faculty Advisor: Maura Pavao, Ph.D.

The bacterium *Agrobacterium tumefaciens* is used to create transgenic plants by inserting DNA from its Ti plasmid into a plant genome. Determining the genetic basis for different metabolic and cellular functions of *Agrobacterium tumefaciens* is of interest due to its economic importance. In this project, a collection of *A. tumefaciens* mutants was created through transposon mutagenesis. The mutants displayed varying phenotypes including increased cell size and increased heat tolerance. One mutant was studied using a scanning electron microscope to look at cell structure in greater detail. Mutant DNA was isolated and sequenced in order to identify the genes knocked out by transposon insertion.

BUSINESS

TREND ANALYSIS UTILIZING SEMICONDUCTOR BUSINESSES

Constanza Bartholomae

Faculty Advisor: Mary Clay, Ph.D.

A Commonwealth Honors Project

The cost of goods sold is one of the largest expenses for any manufacturing business. The aim of this study is to determine how much impact the cost of goods sold has on operating income. Trend analysis, utilizing the Securities and Exchange electronic data-gathering, analysis and retrieval database, will be used to look at the top six United States semiconductor businesses. The 10K consolidated information for the last five years beginning with 2009 and ending with 2013 will be researched for each company. The companies' financial information will be extrapolated from their 10Ks and inserted into a spreadsheet program using Microsoft Excel to analyze the data. The financial information analyzed and obtained could help companies with high cost-of-goods-sold gauge their past financial information to change their strategies and become more efficient in this area.

STRAIGHT AHEAD MINISTRIES

Trevor Bennett, Daniel Figuero, Cameron Fortes, Dana Perry, Macy Washington, Jon Anapol

Faculty Advisor: Jay Mahoney, Ph.D.

A Commonwealth Honors Project

Our team is consulting for Straight Ahead Ministries Inc., which operates three social entrepreneurship ventures in Worcester. Each venture employs former youth offenders and provides mentoring/life coaching, educational opportunities, and job-readiness training. Taking a three-pronged approach, we: (1) have analyzed Straight Ahead Ministries' marketing and social media presence; (2) have explored alternatives and identified the costs/benefits of various marketing strategies, and (3) will empower them to improve their current social media name recognition and marketing campaign. To increase foot traffic to the café and web traffic to the social media pages, we launched a coupon marketing campaign on several local college campuses and established a tracking mechanism to assess effectiveness. We have also worked to integrate all of the social media platforms to give Straight Ahead more control of the tools at their disposal. Our success in this portion of the project will be tracked through social media insight tools and sales statistics.

THE BLUE AND GOLD PROJECT: PROMOTING CULTURAL CHANGE WITHIN WORCESTER STATE UNIVERSITY

Drew Case, Melina Delaporta, Jemini Patel, Jessica Wheeler

Faculty Advisor: Jay Mahoney, Ph.D.

Many primarily commuter universities fight to establish and maintain a strong sense of belonging and cultural identity within their student bodies. Worcester State University (WSU) provides extra-curricular activities that help unite people

with similar interests; however, this is not enough to create a collective community. The Blue and Gold Project is initiating a campaign to remedy this situation through different events. A Day of Giving Challenge, which happened on April 9, raised awareness for previously donated items on campus to encourage future alumni donations. Division III Week, celebrated April 7-13, honored the achievements of WSU student athletes. These events were united under The Blue and Gold Project, which uses fun activities and the completion of the saying “You know you’re a Lancer when…” to raise awareness and unify the student body. It is our team’s hope that WSU will become known for having vigorous student involvement, perpetuated through a strong, positive culture.

THE ON-GUARD INITIATIVE

Julie Broderick

Faculty Advisor: Jay Mahoney, Ph.D.

A Commonwealth Honors Project

The risk of suicide among corrections officers is 39% higher than average and post-traumatic stress disorder, abuse and divorce rates are greater than the general working population; the average life span of a corrections officer is 47 years. On-Guard was created to build a non-profit to raise awareness about mental health and suicide prevention among corrections officers. We created a network, established a board of directors, secured legal services and began the process to establish a 501(c)(3) entity. To build trust and commitment within the corrections officer community and to generate funds, we hosted the first annual On-Guard 5K Road Race, raising over \$6,500. We provided information tables to mental health professionals and support groups and got our message out to over 200 people. With the support of local, state and federal unions and the Worcester County Sheriff’s Academy and others, we are hosting the second annual 5K on April 27, 2014. Initial registrations indicate a significant increase in participation.

FINANCIAL LITERACY FOR LATINO EDUCATION INSTITUTE’S CLUB-E ESL STUDENTS: AN ENACTUS PROJECT

Ania Hoscilo, Diego Rodrigues Alves, Nancy Moreira, Victor Palencia

Faculty Advisors: Jay Mahoney, Ph.D, Steven Favulli (Latino Education Institute)

Financial literacy is essential to establish and maintain credit worthiness. Early debt can severely limit career, educational, and personal options. The WSU Enactus Team partnered with the Latino Education Institute (LEI) Club-E to offer classes on financial-oriented topics, such as how to save money, how to open a bank account, understanding tax withholdings and deductions, setting a budget, tracking expenses, and managing credit cards and credit ratings. The students from the ESL program are adults who come to WSU to learn and improve their English skills. Our project employed the MoneySKILL platform and took advantage of the curriculum flexibility to best meet the unique needs of our target population. With a range of ages and technological and language skills, we took a step back, reverting to pencil and paper and simplifying the language throughout the classes. We also developed and translated a set of pre- and post-tests to assess students’ financial literacy.

CHEMISTRY

REACTIONS OF HNO WITH BIOLOGICAL TARGETS: THIOL MODIFICATION IN CYSTEINE CONTAINING PROTEINS

Colleen Au, Brian Walker

Faculty Advisor: Susan Mitroka

As nitric oxide is an important biological mediator, the notion that other nitrogen oxides may have possible biological importance has received much attention. Accordingly, nitroxyl (HNO) has been the focus of much interest over the past 20 years. Having a chemistry distinct from nitric oxide, HNO shows promise of therapeutic utility for several diseases. While an established, biologically active compound, the chemistry driving HNO’s biology has yet to be sufficiently studied. The post-translational modification of thiols to form sulfinamides or disulfide bonds is thought to be the main mode of action of HNO. In this work, we examine the reactions of HNO with the thiol groups of cysteine containing proteins, focusing on thiol modification as well as the inhibition of activity. Treatment of these pure proteins clearly results in structural and activity changes that are currently being evaluated and will be discussed.

GREENER REMEDIATION OF CHROMIUM (VI) USING CELLULOSE FILMS

Kayla Paradis

Faculty Advisor: Meghna Dilip, Ph.D.

Aqueous Biphasic Systems (ABS) may be formed by salting out hydrophilic ionic liquids or polymers using a kosmotropic salt such as K_3PO_4 . We report quantitative partitioning of the environmental contaminant chromium (VI) using ionic liquid based I/I ABS. However, as with most I/I separation separations the recovery of the analyte is challenging. To overcome these challenges, an ionic liquid assisted method was successfully developed. Using ionic liquid as a solvent for the dissolution of cellulose, cellulose films were prepared. The prepared films were salted out similar to polymer-based ABS and allowed for effective partitioning of chromium (VI). Batch and column studies were conducted. Effects of type and concentration of kosmotropic salt, concentration of chromium, and temperature on percent removal and recovery are reported.

SYNTHESIS AND CHARACTERIZATION OF PHOTOACTIVE COUMARIN-CONTAINING POLYMERS

Edward Poku, Daniel Jazwinski

Faculty Advisor: Margaret Kerr, Ph.D.

Coumarin is a naturally occurring, sweet-smelling, and bitter-tasting molecule that is found in various plants. Derivatives of coumarin have already various uses, such as in the medical field for its anticoagulant, antibiotic, and antifungal properties, and as an additive in perfumes. Coumarin is also a photochemically active molecule that is capable of induced dimerization when irradiated with ultraviolet light. The synthesis and characterization of three coumarin derivatives are described in this poster. In addition, the kinetics of dimerization of each molecule was also studied. These molecules will be added to a polyester backbone to create photoactive polymers. Future work will include a more in-depth study of photoactive coumarin-containing polymers, specifically the effect the dimerization has on the water solubility.

PHOTO CHEMICAL PROPERTIES OF COUMARIN

Pablo Larrea

Faculty Advisor: Joseph Quattrucci, Ph.D.

Coumarin and many of its derivatives are photo-chemically active compounds that have a wide range of uses from the medical field to the food industry. When exposed to ultraviolet light, they can undergo a dimerization process. Coumarin and its derivatives can also be used to create water-soluble, photo-active polymers when attached to poly-vinyl alcohol that can be used as photoresists. Dimerization of these coumarin containing polymers can yield a water-resistant surface important in surface etching processes. Understanding the effects of the substituents and the solvent on the rate of dimerization can be important in this process. In this experiment, we studied that rate of dimerization of 7-hydroxy-4-methylcoumarin and 6,7-dihydroxy-4-methyl coumarin and the rate of dimerization of 7-hydroxy-4-methylcoumarin in various solvents.

SYNTHESIS AND SUBSTITUTION EFFECTS ON THE PHOTODIMERIZATION OF MONO – AND DIALKYOXY-4-METHYLCOUMARINS AND THEIR APPLICATION IN POLYMERS⁺

Thamrongsak Cheewawisuttichai

Faculty Advisor: Margaret Kerr, Ph.D.

Mono- and dialkyloxy-4-methylcoumarins were successfully synthesized starting from dihydroxy-4-methylcoumarins and an alkyl bromide, butyl bromide or octyl bromide, at 1:1 molar ratio. The alkylation of 5,7-dihydroxy-4-methylcoumarin gave 5,7-dialkyloxy-4-methylcoumarin and two monoalkyloxy-4-methylcoumarins with substitution at 5 and 7 positions. For 6,7- and 7,8-dihydroxy-4-methylcoumarins, the corresponding dialkyloxy-4-methylcoumarins and only monoalkyloxy-4-methylcoumarins at the 7 position were obtained. Ultraviolet light absorption studies of the dihydroxy-4-methylcoumarins and their mono- and dialkyloxy products showed a red shift of the maximum absorption wavelengths compared to 4-methylcoumarins. The photodimerization of these coumarins in DMSO mainly depended on the substitution positions. Among all the coumarin derivatives studied, 5,7-dibutyloxy-4-methylcoumarin exhibited the highest dimerization degree. We are currently working to incorporate 5,7-dibutyloxy-4-methylcoumarin, which has the highest efficiency of dimerization, into photoactive polymers. Additionally, we are working on the synthesis and characterization of new coumarin derivatives in order to produce polymers that incorporate the photoactive component within the framework of the polymer.

DESIGN AND SYNTHESIS OF WATER SOLUBLE PNP Pincer COMPLEXES FOR CATALYSIS IN WATER**Kenneth Zielinski****Faculty Advisor: Jeremy R. Andreatta, Ph.D.**

Due to the increasing restrictions associated with use and disposal of organic solvents in industry, there is a piqued interest in the development of catalysts that can function in or are soluble in water. Previously, the water soluble phosphine PTA (PTA = 1,3,5-triaza-7-phosphaadamantane) has been used as a neutral monodentate ligand to impart water solubility to transition metal complexes; however, some of these complexes suffer from unpredictable reactivity (such as isomerization) or catalyst decomposition under the reaction conditions required for catalysis. Therefore, the development of water soluble multidentate bis-PTA PXP (X = C or N) pincer ligands and subsequent metal complexes could lead to a new and useful class of catalysts for a variety of transformations in aqueous, biphasic, or ionic liquid media. Specifically, hydrogenation of abundant, relatively inert, and cheap carbon dioxide to more useful forms would provide a novel environmentally benign application for such complexes.

WHAT ARE THEY? POLYETHYLENE SCRUBBING BEADS FROM PERSONAL CARE PRODUCTS**Brianna Brosnan****Faculty Advisor: Meghna Dilip, Ph.D., Kathleen Murphy, Ph.D.**

Several exfoliating face washes on the market contain micro-polymer beads. These beads scrub the skin and exfoliate, but unfortunately these non-biodegradable beads travel into the water systems and have been found in the Great Lakes. We tested popular face wash exfoliators and obtained g of beads/ g of face wash in each brand. The size distribution of the beads was characterized using a scanning electron microscope. Toxicity of the isolated beads was also tested using a simple lettuce seed assay.

TRANSITION METAL DIMETHYLGLYOXIME COMPLEXES FOR THE RING OPENING POLYMERIZATION OF RENEWAL MONOMERS**Ramtha Lahdo****Faculty Advisor: Jeremy Andreatta, Ph.D.**

Ring opening polymerization (ROP) of monomers from renewable resources to produce biodegradable polymeric materials has become a popular area of study. Most of the money spent in recent years has been on materials made from plastic, with harmful effects to the environment. The aim of this research is to understand the effects of: a) metal identity, b) ancillary ligand effects, c) ligand electron effects on the polymerization process of the transition metal dimethylglyoximate complexes and create a template for the design of new catalyst materials. Using the University's DSC, the melting and glass transition temperatures of the polymers could be obtained, as well as the molecular weight, and the structures of the isolated materials for better understanding for the ROP of cyclic esters and other naturally derived monomers.

HEAVY METALS IN RICE**Jennifer Tran****Faculty Advisor: Anne Falke, Ph.D.**

Chronic exposure to arsenic, a toxic heavy metal, results in higher rates of skin, bladder, and lung cancers as well as heart diseases. The FDA claims that there is between 2.6 and 7.2 μg of inorganic arsenic per serving of rice. However, rice grown in the South could potentially have more arsenic than rice in California due to the rice in the South being grown over cotton fields where arsenic-based pesticides were used, leaving arsenic residues contaminating the soil. The agency set a maximum of 0.5-2 ppm of inorganic arsenic in food. Daily intake of 3.0 $\mu\text{g}/\text{kg}$ or more has been shown to increase the incidence of lung cancer by 0.5%. Cadmium is another toxic heavy metal that is known to accumulate in the renal cortex, located in the kidney, and cause problems there. Studies show that an average person living in an uncontaminated environment ingests about 10 to 25 μg of cadmium per day. Adverse health effects may occur if the cadmium concentration in the renal cortex is over 200 $\mu\text{g}/\text{g}$. Copper is a mineral that is found in rice that provides health benefits such as improving wound healings,

treating osteoarthritis and osteoporosis. The World Health Organization established that 10-12 mg/day of copper day is the maximum amount of copper a person should consume. Exposure to high concentrations of copper causes damage in the liver and kidney. Studies show an average of 0.18 mg of copper per 100 grams of brown rice. In this research, we are using Atomic Absorption Spectrometry to determine the amounts of arsenic, cadmium, and copper in various types of rice. Additionally, we will examine organic rice grown in different parts of the country to determine if concentrations of metals differ by location.

THE WHOOSH BOTTLE DEMONSTRATION EXAMINED

Ian Evans

Faculty Advisor: Anne Falke, Ph.D.

Through the use of a simple demonstration, the Whoosh Bottle, and the combustion of alcohol fuels two undergraduate laboratory experiments were created to involve junior and senior students with Gas Chromatography – Mass Spectrometry (GC-MS) instrumentation and general chemistry students with fundamental chemistry concepts. The demonstration was carried out in a plastic polycarbonate 5-gallon jug using isopropyl alcohol, ethanol, and methanol fuels. Students enrolled in Instrumental Analysis or Chemical Analysis class would take the byproducts of these combustions, and analyze them through GC-MS for trace organic compounds. From the results, the students could discuss what other chemical reactions might occur during the combustion as well as make a real-world connection to air pollutants. The second laboratory experiment was geared towards students enrolled in General Chemistry. Using the same fuels, with added chloride salts for a colored flame, and a 5-gallon plastic polycarbonate jug, the students would be introduced to combustion and exothermic reactions, atomic theory, and the electromagnetic spectrum. The goal for the General Chemistry students was to expose them to a fun, engaging, and safe demonstration that related to the concepts above. I will develop a worksheet with regards to the demonstration and test their understanding of the concepts that coincide. From each experiment, a detailed protocol was constructed for reproducibility as well as talking points and question ideas for the students.

ACTIVITY OF GAPDH ENCAPSULATED IN CELLULOSE FILMS

Ophelia Okoh, Susan Mitroka, Meghna Dilip

Faculty Advisor: Meghna Dilip, Ph.D.

Cellulose films containing glyceraldehyde 3-phosphate (GAPDH) were prepared using the green, non-volatile solvent 1-butyl 3-methyl imidazolium chloride. Following encapsulation, activity of the enzyme was tested through monitoring the GAPDH catalyzed conversion of glyceraldehyde-3-phosphate to D-glycerate-1,3 bisphosphate via UV/Vis. The results of this project potentially provide new information about environments to store enzymes in order to increase or decrease activity for further use.

THEORETICAL STUDY OF THE INTERACTIONS OF NICKEL WITH GRAPHITE AND GRAPHENE SURFACES USING THE VIENNA Ab-INITIO SIMULATION PACKAGE

Daniel Glukhov

Faculty Advisor: Joseph Quattrucci, Ph.D.

Carbon nanotubes have been researched heavily for their ability to store elemental hydrogen. It is theorized that a “spillover” mechanism is involved in the process of hydrogen bond-breaking. This mechanism relies on a metal catalytic support over which the hydrogen bond breaks. In this work, we investigate a nickel atom, as a catalytic site, adsorbed to graphite, graphene, and carbon nanotubes. The Vienna Ab-initio Simulation Package (VASP) is used to theoretically investigate the preferred binding site of the nickel atom. In addition, the energy associated with nickel coverage is determined. This work is a precursor to performing dynamics calculation for the dissociation of molecular hydrogen to the nanotube surface.

WHAT IS THE BEST COMBINATION OF MATRIX/ANALYTE FOR MATRIX-ASSISTED LASER DESORPTION/IONIZATION (MALDI) ANALYTICAL TECHNIQUE?

Huong Doan

Faculty Advisor: Joseph Quattrucci, Ph.D.

Matrix-assisted laser desorption/ionization (MALDI) is a powerful analytical technique for identifying large organic and biological molecules, such as proteins and polymers. Typically, a proton transfer from matrix to analyte allows for mass/charge time of flight analysis of the analyte. Alternatively, an electron transfer process can be used to ionize the analyte. This can result in a soft ionization, which leaves the analyte intact allowing for the observation of a single peak in the spectra. Understanding the ionization potential of the matrix can assist in predicting the best combination of matrix and analyte. Gaussian software is used to calculate the ionization potential of a series of poly (p-phenylene vinylene) (PPV) molecules. Currently, there are two matrixes found to be suitable for soft ionization of the analyte hexaphenyl benzene (HBB).

CORROSION STUDIES OF AUTOMOBILES USING ATOMIC FORCE MICROSCOPY

Mateo Kocaj

Faculty Advisor: Joseph Quattrucci, Ph.D., Meghna Dilip, Ph.D.

Halite, the mineral form of sodium chloride (NaCl), is used to deice roads in the winter. However, NaCl is also known to speed up corrosion of metals. We attempt to simulate road salt conditions and study their effects on corrosion of metallic car parts. Atomic force microscopy (AFM) is used to study the surface topography changes. Factors such as concentration of salt, temperature, and time of exposure were studied.

STABILIZATION STUDIES OF METAL-CHELATING COMPLEXES VIA COMPUTATIONAL METHODS

Kweku Acquah, Lucas Miller, Victoria O'Brien, Eihab Jaber, Ph.D.

Faculty Advisor: Eihab Jaber, Ph.D.

The Bidentate chelating ligands of a metal ion are known to result in a more stable molecule due to the chelate effect when compared with monodentate ligands on the same metal ion. For this poster presentation, we examined the enthalpic contribution to the stabilization of the metal ion complexes as the ligands change from monodentate to bidentate and subsequently as the molecule itself becomes more macrocyclic. Copper (II), Cadmium (II), Silver (II), Palladium (II), and Nickel (II), were used as the subject metal ions, and the monodentate and bidentate chelating ligands were NH₃ and ethyldiamene (EN), respectively. The calculations were performed using the molecular orbital methods at the ab initio (Hartree-Fock, Density Functional Theory, and MP2) levels using GAUSSIAN 09.

COMMUNICATION

THE NEED FOR GRADUATE DEGREE ATTAINMENT AMONG WORCESTER STATE UNDERGRADUATE STUDENTS: JOBS AND FINANCIAL SECURITY IN THE 21ST CENTURY**

Ryan Miller, Joseph Phillips, Ashley Anthony, Daniel Hartnett

Faculty Advisor: Emanuel Nneji, Ph.D.

This study presents findings from a quantitative survey conducted in the fall of 2013 by 15 students from the Public Relations Research class, CM 400, who were supervised by the instructor Emanuel Nneji, Ph.D., on behalf of the Communication Department. The overall objective of the study was to gauge the perceptions of Worcester State students about several important issues pertaining to pursuing a graduate degree in communication, including degree attainment, its quality and value, associated costs, and innovative learning models. The study measures WSU students' attitudes about higher education generally, and communication in particular, as well as other topics, namely, barriers to attaining a bachelor's or graduate degree and the responsibility for financing higher education. To achieve these objectives, the class conducted 1,009 interviews with students, both on- and off-campus residents, and cell-phone-user households. In conclusion, there is consensus among Worcester State students that attaining a degree beyond a bachelor's degree is important. While only about three in 10 report having thought about earning an advanced degree, most students are nonetheless convinced of the importance of getting an education beyond a bachelor's degree for job and financial security in the 21st century.

STRATEGIC PLAN FOR WORCESTER CENTER FOR CRAFTS: CREATING AWARENESS, EXPOSURE AND FUNDING FOR “CARNAVAL” 2014**

Daniel Williams, Shyna Trova, Jacob Poplaski, Taryn Lielasus, Francesca Presti, Kaitlyn Haselton
Faculty Advisor: Emanuel Nneji, Ph.D.

This plan creates a public relations strategy for the Worcester Center for Crafts, using information collected from secondary and primary sources by a group of six students in the class of CM 240 (Principles of Public Relations) in the fall of 2013, who were supervised by Emanuel Nneji, Ph.D. The plan is based on the goal of increased awareness, exposure, and funding for WCC’s 2014 “Carnaval” exhibit. The study identifies five target publics that could help WCC accomplish these goals, and multiple objectives and tactics for each target public. The Center is a non-profit, independent, community-based arts organization, committed to providing quality craft education, supporting entrepreneurship in the arts, and promoting appreciation for fine crafts. Established in 1856 as the Worcester Employment Society, the Center established a tradition of economic empowerment by teaching immigrants the skills needed to create and sell crafts. In conclusion, the plan identifies WCC’s affiliation with Worcester State University as a significant strength for helping fulfill the Center’s crafts education mission but also identifies a poorly constructed and maintained website as a significant weakness. Our panel will discuss the details of our research and plan.

MEDIA IN SOCIETY BOOK PUBLICATION**

Julie Frechette, Ph.D.

Communication Professor Julie Frechette, Ph.D., co-authored the textbook *Media in Society* (2014, Bedford / St. Martin’s Press). The book provides students a unique, narrative-based approach to media criticism, exploring the stories media tell as well as the stories we tell about the media when we describe how it affects us. Organized thematically, *Media in Society* examines topics like narrative genre, entertainment culture, news, politics, and economics, emphasizing both the pleasures and pitfalls of the media narratives that surround us. Frechette is accompanied by an esteemed team of media scholars as co-authors that include Richard Campbell (Miami University), Bettina Fabos (University of Northern Iowa), Joli Jensen (University of Tulsa), and Douglas Gomery (Emeritus, University of Maryland).

COMMUNICATION SCIENCES AND DISORDERS

BREAKING DOWN THE BARRIERS OF HEARING LOSS*

Courtney Needham, Caitlyn Cashman
Faculty Advisor: Susanna Meyer, Ph.D.

Hearing loss is the third most common chronic health condition facing older adults. Approximately one-third of individuals over 65 years of age have some form of hearing loss. This not only affects communication, but also diminishes their quality of life. Worcester State University graduate students in Speech-Language Pathology developed a presentation entitled “Breaking Down the Barriers of Hearing Loss,” which was presented at five local Worcester senior centers and assisted living facilities to demystify hearing loss, hearing aids, and audiological evaluations. During this interactive presentation, participants had the opportunity to learn and role-play communication strategies such as how to manipulate environments, repair strategies to use when communication breakdowns occur, and how to speech read. In addition, information regarding modern hearing aids, hearing assistive technology, and aural rehabilitation was presented. This presentation educated over 60 senior citizens about ways to improve their quality of life.

OPTOGENETIC STIMULATION OF THE AUDITORY CORTICOFUGAL SYSTEM**

Maryanna Owoc
Faculty Advisor: Keith Darrow, Ph.D.

The auditory corticofugal system has been implicated in a range of cognitive functions including memory consolidation and dynamic sensory filtering. This project is designed to investigate the influence of this descending system on signal processing of ascending auditory stimuli in lower brainstem centers and within the cochlea. Optogenetics, i.e. using light to activate genetically modified neurons, provides a means to study real-time influence of this descending system on lower auditory

centers. Channelrhodopsin-2 was injected into the auditory cortex (Actx) of CBA/CaJ mice. After four weeks, the Actx was optically stimulated with simultaneous recordings in the inferior colliculus (IC). Recordings revealed enhanced concurrent tone-evoked activity in the lateral portion of IC and enhanced neural synchronization in the IC central nucleus. Future work will investigate the effects of corticofugal modulation of cochlear output by studying effects of optical stimulation of Actx with concurrent recordings of near-field cochlear neural potentials. My panel will review these findings and discuss their effects on hearing.

DESCRIPTIONS OF CONCRETE OBJECTS BY PEOPLE WITH APHASIA

Colleen MacWilliam

Faculty Advisor: Sharon Antonucci, Ph.D.

A Commonwealth Honors Project

Aphasia, a language impairment associated with stroke, can cause difficulty producing and understanding language, and is associated with word retrieval difficulties. Along with word retrieval difficulty, persons with aphasia may have subtle difficulty processing types of meaning information about objects they try to name. To better understand the relationship between semantic knowledge and word retrieval, data were collected with participants with stroke-aphasia, and with age- and education-matched controls. Participants were asked to describe a series of nine living concepts (e.g., cow) and nine nonliving concepts (e.g., clock). These responses were analyzed for the types of semantic information they contained (e.g., what the object looks like, how it is used). Through this research, comparing across categories will provide information regarding whether people with aphasia may have difficulty retrieving different types of semantic feature information and how they differ from individuals without brain injury.

IMPROVING MUSEUM DOCENT'S SPEECH INTELLIGIBILITY THROUGH CLEAR SPEECH TRAINING

Alison Hickey

Faculty Advisor: Susanna Meyer, Ph.D.

A Commonwealth Honors Project

Museum docents must have the ability to communicate and convey information to diverse audiences, including visitors with communication disorders. Individuals with communication disorders benefit from modified speech since they require accommodations in communication such as Clear Speech. Clear Speech involves speaking at a slower rate with increased pauses and longer durations. This research project investigated if participation in a Clear Speech workshop affected the speech intelligibility of docents at the Worcester Art Museum. A speech sample was audio recorded of each docent reading aloud. After attending the Clear Speech workshop, another sample was collected, and the results were acoustically analyzed including duration, pause time, and syllables per second. The results demonstrated a significant improvement in all variables indicating that Clear Speech is an effective training for museum docents to accommodate individuals with communication disorders. Director of the Speech-Language-Hearing Center Ann Veneziano-Korzec, M.S., CCC-SLP, Dean of the School of Education, Nursing and Natural Sciences Linda Larrivee, Ph.D., and Katrina Stacy of the Worcester Art Museum assisted with the project.

HEARING LOSS PREVENTION IN THE ENTERTAINMENT INDUSTRY*

Molly Drenzek, Kathryn Harlukowicz, Erica Henrickson

Faculty Advisor: Susanna Meyer, Ph.D.

Individuals who work in the entertainment industry are often at risk for noise-induced hearing loss (NIHL). Servers, bartenders, performers, disc jockeys, and other staff at bars, restaurants, and clubs may be subjected to noise exposure levels that cause permanent hearing damage without use of proper ear protection. University students are frequently employed in these jobs and may not be aware of the risk for hearing loss. The Occupational Safety and Health Administration's (OSHA's) Hearing Conservation Program provide requirements for employers to monitor noise exposure levels and to supply protection to their employees. Many establishments violate safety standards, including exceeding recommended noise levels. Thus, the poster provides methods on how individuals can actively protect their hearing. Individuals must learn techniques for selecting ear plugs and monitoring decibel levels using smartphone applications. Additionally, information is provided regarding warning signs of NIHL. If individuals experience these symptoms, they should schedule a hearing evaluation.

COMPUTER SCIENCE

THE NIH GENE DATABASE: CHANGING DATABASE MODEL AND INTEGRATING*

Adam Pendleton

Faculty Advisor: Elena Braynova, Ph.D.

The goal of the project is to convert data from the National Institutes of Health gene database into an SQL database and perform SQL queries on it. The header data is split into multiple relations to facilitate access and cross-referencing to the data fields and to integrate additional data sources. The actual genetic sequence is stored in several formats. One of them is the pure base-pair sequence. The second format represents the data using a more concise amino acid sequence derived from the base-pair data. Additional formats are generated by dictionary algorithms to compress the data, and to improve efficiency of processing data with large, frequently-occurring segments.

A PERSPECTIVE ON LINKING AND INTEGRATING DISCRETE MATHEMATICS AND DATA STRUCTURES

Aparna Mahdev, Ph.D., Elena Braynova, Ph.D.

In this integrative teaching and co-linking of courses, Discrete Mathematics (MA 220) and Data Structures (CS 242) were taught in a manner so students can see the connection between these two courses. By choosing the coverage of topics in both the courses carefully, student learning was enhanced by reinforcing the mathematical concepts learned in MA 220 in CS 242. We worked together to coordinate the coverage of the topics so as to maximize the student learning. Students had the opportunity to make connections not only between these two courses, but also between how what is being learned in the classroom fits into a broader scope of learning and how mathematical concepts are applied across other courses in the curriculum. In this poster presentation, we describe how these two courses were structured, what we encountered, what worked well and what still needs improvement.

CRIMINAL JUSTICE

SCHOOL VIOLENCE

Dan Williams, Joshua Poole, Samantha Mathieu, Brian Sanchioni, Marquez McKrieth-Collins

Faculty Advisor: Robert Brooks, Ph.D.

During the 2014 spring semester, our group from Dr. Robert Brooks' School Violence course has elected to focus on bullying in a New England high school. We are currently collecting all of the data that is publicly available, and we are meeting with the administration of this school. Our goal is to study the school environment by using a questionnaire and also by conducting focus group interviews with staff and students. We are looking to find out if bullying is an issue at the school and what the reasons might be for this issue to exist. Not only do we hope to learn about the rate of bullying in this school, but we also hope to offer possible solutions if a bullying issue does exist. This research process will be aided by the students from Dr. Brooks' Research Methods Class.

PLAN AHEAD

Nicholas Mardirosian, Amy Rundell, Timothy DelloRusso, Andro Hannoush

Faculty Advisor: Robert Brooks, Ph.D.

As Worcester State University students, we are conducting a program evaluation of a New England school's anti-bullying program. We are gathering data to determine if the school's anti-bullying program is being implemented in ways that kids can understand. We are also going to gather data on whether or not parents understand and agree with the school's anti-bullying program. Surveys will be administered to parents to determine if they understand the anti-bullying program and if they feel their child is participating in bullying. Observation at the school will be done to see if any activity involving school violence occurs, especially during lunch and recess. With this data, we will be able to determine if there are any problems that need to be addressed in the school's anti-bullying program.

SCHOOL VIOLENCE AND BULLYING PREVENTION RESEARCH

Ashley Wise, Ted Qarri, Tyler Hiltz, John Calo, Matthew Guinee
Faculty Advisor: Robert Brooks, Ph.D.

As a team, we will be conducting research on bullying and school violence prevention in a high school in New England. Data will be extracted using methods such as interviews and surveys aimed towards a focus group. One of our main goals is to use our gathered data to determine if current bullying prevention programs at the school are truly effective. Most importantly, we are striving to create a partnership with the school and community in order to offer our results and make improvements to their current prevention programs. Our results will be presented once our research has come to an end and has been finalized.

SCHOOL BULLYING RESEARCH

Michael Fusaro, Brett Pettis, Ryan Lemoyne, Kathryn Patrick, Kevin Gatto
Faculty Advisor: Robert Brooks, Ph.D.

The research we will be conducting will allow us to work closely with teachers, parents, and students ranging from kindergarten through high school on the issue of bullying. We will conduct this research, analyze the data, and help schools improve their anti-bullying programs. Having an opportunity to conduct research in a school setting is invaluable as it will help us gain knowledge about how to conduct ethically sound research that provides data about elements of our society. The completion of this project will leave us with a great deal of important knowledge surrounding school bullying and its effects. As criminal justice students, we have the opportunity to work with schools around us and help them increase the effectiveness of bullying prevention, while working to decrease levels of school violence.

SCHOOL BULLY PREVENTION

Phillip Cepeda, Anthony Mantelli, Dylan D'Angelo, Jacob Bliss, Corey Pham
Faculty Advisor: Robert Brooks, Ph.D.

The focus of our project was a program evaluation that looked at a K-12 New England school district's bullying prevention program. We have analyzed and critiqued their bully prevention tactics. In doing this, we are able to understand where it needs to be improved and where it can be left alone. We first interviewed the school administrator and asked a series of questions that truly tested how adequate this bullying prevention program really was. Once we finished collecting data from the administrator, we focused on the students. After collecting all of our data, we then compared the results from both parties and also compared them to the past programs. This gave us an idea of whether or not these programs were actually working.

SCHOOL BULLYING EXPERIMENT

Justin Bonina, Tyler Jordan, Rob Pruyne, Steve Gannon
Faculty Advisor: Robert Brooks, Ph.D.

During this experiment, we will be traveling to a New England school to research if bullying is a significant factor within that school. The purpose is to discover if the school currently knows if bullying is occurring and in what form. We will also be trying to discover what bullying policies the school has and if the policies this school created are actually working. During this experiment, we will interview the police officer assigned to that school, the guidance counselor of the students, and a member of the administration. These will be performed to try and get a better understanding of the current environment in this school. We will share the results with school officials so they can draft the proper policies for their student body.

BULLYING PROGRAM EVALUATION

Joao Bernardo, Gintare Naruseviciute, Theresa Toombs, Meghan Vaughan, Ashley Young
Faculty Advisor: Robert Brooks, Ph.D.

The purpose of our study is to evaluate the bullying program and procedures of a New England middle school. The principal would like to use an opt-out consent, whereby the students will be in the study unless the parents choose to pull them from it.

We will be administering a survey to students and teachers regarding their bullying program and their views on bullying. The survey is made up of questions from a few different surveys. The surveys will be taken online and the results will be analyzed to determine the effectiveness of the school's anti-bullying program and policies. Using these results, we will be able to recommend different tactics that the principal can use in order to better the program or to make it more efficient. Our hope is to provide this school with information that will help them improve their bullying program. We will discuss the details of this project and findings to date during our panel discussion.

BULLYING

Zachary Pappas, Ashley Minkema, Peter Gerardi, Shea O'Malley, Hayley Terry
Faculty Advisor: Robert Brooks, Ph.D.

Our mission for this project is to carefully research a New England area elementary school's policies concerning bullying. We will specifically be asking these questions: Does bullying occur more often at lunch/recess or in the classroom, according to reports? Which grade had the highest incidences of bullying and school violence reported among students? How often is bullying reported to the administration of this school? Which grade sees the highest incidences of bullying? Does any cyber-bullying occur in school? What kinds of steps and measures do teachers take when bullying occurs? Do teachers see cyber-bullying occurring in the school? How often do fights occur between students? Are these confrontations more along the lines of physical or verbal confrontations? Is bullying a major issue within the school? As a group, we will figure out any existing issues with this school's programs. We will survey the staff and administration. We will also be collecting existing data (if available). We would also like to conduct a "school climate questionnaire," which we will conduct with the staff and will consider conducting with students. We will also give them new ideas that they may add to their existing program.

SCHOOL BULLYING EVALUATION STUDY

Matt Wolak, Derek Kareta, Bryan Dunham, Kevin Shaughnessy, Nicole Shephard
Faculty Advisor: Robert Brooks, Ph.D.

Today, bullying plays a large role in and outside of schools. In order to get a better understanding of bullying and how many people are bullied, our group is distributing questionnaires for middle/high students to fill out. The goal of this project is to become more informed about bullying and to seek better prevention techniques. This study will also seek to figure out the different types of people who bully, why bullying occurs, and most importantly, how those who are bullied feel and react. This study will also compare the amount of bullying between male and females and uncover the average age at which bullying occurs. Questionnaires will be completely anonymous and will put no pressure on the students. Together, we can learn about the cause and effects of bullying and how it impacts teenagers. We will review details of our work and outcomes to date during our panel discussion.

EDUCATION

NEUROPSYCHOLOGY OF DYSLEXIA PHONOLOGICAL AND PHONEMIC DEFICITS*

Kelly Giorgi, Krystin Hickey
Faculty Advisor: Diane Tighe Cooke, Ph.D.

This poster presentation focuses on the neuropsychology of dyslexia; specifically in the areas of phonological and phonemic deficits. Throughout this research presentation, information relative to the broad skill that includes encoding, identifying, and executing sound units of oral language is presented. Specific topics discussed include the difference between phonological processing and phonemic awareness, the definition and prevalence of dyslexia, areas of the brain where reading tasks are processed, the causes and etiology of phonological deficits, the symptoms and characteristics displayed by dysphonetic readers, comorbid difficulties, and effective curriculum modifications. Furthermore, assessment and progress monitoring tools, as well as strategies for overcoming the challenges of reading difficulties are provided. Helpful resources for educators, parents, and dysphonetic readers are available via the poster.

 THE NEUROPSYCHOLOGY OF ANXIETY*

Jillian Ouellette, Stephanie Kunst
Faculty Advisor: Diane Tighe Cooke, Ph.D.

Anxiety is a normal reaction to stress that can actually be beneficial in some situations. However, for some people, anxiety can become excessive. Anxiety encompasses a wide range of disorders, including obsessive-compulsive disorder, panic disorder, and post-traumatic stress disorder. The purpose of this poster is to explore the neuropsychology of anxiety, specifically the brain-behavior relationship, through the review of studies. Various assessment techniques practitioners use within and outside of school settings to diagnose this internalizing disorder will be highlighted. Evidence from various popular studies regarding the septo-hippocampal system and other brain structures contribution to anxiety is explored in this poster. Additionally, the impact of anxiety within the school will be addressed, including cognitive abilities, eligibility for special education requirements, and treatment and intervention.

FIRST SCHOOL-WIDE POSITIVE BEHAVIOR SUPPORTS PROGRAM: IMPROVED OUTCOMES, BUT MORE WORK REMAINS*

Jillian D. Karns
Faculty Advisor: Denise Foley, D.Ed.

This poster was recently presented at the 2014 National Association of School Psychologists' Annual Convention. It describes the development, implementation and initial results of a school-wide Positive Behavioral Intervention (PBS) program in a Worcester-area elementary school. Initial evaluation results of the effectiveness of the model using both objective behavior and subjective data are shared. These include the perspectives of teachers and the school psychologists instrumental in creating it. Participants will understand: School psychologists' pivotal roles in the development, implementation and evaluation of a school-wide PBS; the positive effects on time-on learning, student behavior and disciplinary referrals; various faculty and staff perspectives and recommendations; and next steps in the evolution of the program.

THE NEUROPSYCHOLOGY OF DYSCALCULIA*

Andrea Morales, Stephanie Desmarais
Faculty Advisor: Diane Tighe Cooke, Ph.D.

This poster will present information on dyscalculia, which is a specific learning disability in mathematics. It includes a specific learning difficulty or a range of lifelong learning disabilities in mathematics. It may also cause an inability to perform certain or all mathematical operation, which can vary from person to person and affect people differently at different stages in life. The different subtypes of dyscalculia include procedural, verbal, and semantic. This learning disability currently affects about 3-6% of students within the school population (Shalev et al., 2000). Causes of dyscalculia are unknown, but may include genetics, environment, lack of proper instruction and/or exposure to instruction, neurological deficits, and math anxiety. Symptoms include difficulty with simple basic math facts including addition, subtraction, multiplication, and division. And also range to more complex and abstract forms of math such as word problems, algebra, and geometry. Students exhibiting difficulty in math and/or other academic subjects may be eligible for special education services.

HELPING STUDENTS "READ NATURALLY" THROUGH COMPUTER-BASED FLUENCY TRAINING*

Diana B. Fuller
Faculty Advisor: Denise Foley, Ed.D.

This poster was presented at the 2014 National Association of School Psychologists' Annual Convention. It summarizes a study that examined the use of the Read Naturally intervention program with students (n=32) in a suburban elementary school in Central Massachusetts. The results of this pilot study demonstrated that Read Naturally can be used as an effective intervention for closing the achievement gap of students who enter in grade two through six with a deficit (but a not disability) in the area of reading fluency. All but two students in this study either closed the achievement gap based on benchmark and progress monitoring scores from the Dynamic Indicators of Basic Early Literacy-Sixth Edition or made "ambitious growth" as defined in the literature. Implications for practice and recommendations for future research are described.

THE NEUROPSYCHOLOGY OF READING COMPREHENSION*

Leah Ritacco, Jena Bastardo

Faculty Advisor: Diane Tighe Cooke, Ph.D.

In order for a student to demonstrate proficiency in reading, the student must master several different domains. "Reading comprehension is multifaceted and requires the synchrony of a number of reading related processes in order to derive meaning from text" (Ghelani, Sidhu, Jain, 2004). Research has found certain areas of the brain to be associated with reading comprehension including right frontal areas, the temporal lobes, and the posterior cingulate (Mar, 2004). Under the Individuals with Disabilities Act (IDEA, 2004), deficits in reading are classified under Specific Learning Disabilities (SLD) (Cortiella, 2010). The neuropsychology, process of identification, interventions, and resources for parents on the topic of specific learning disability in the area of reading comprehension are addressed in this poster presentation.

THE NEUROPSYCHOLOGY OF AUTISM*

Tessa Lashley

Faculty Advisor: Diane Tighe Cooke, Ph.D.

This poster provides an overview of the neuropsychology of autism. The diagnostic criteria for Autism Spectrum Disorder (ASD) according to the new Diagnostic and Statistical Manual of Mental Disorders, Fifth Edition (DSM-5) is examined. The focus of this presentation is on the underlying neurological processes involved in ASD, which are exhibited in social impairments and repetitive/stereotyped behaviors. With rates of ASD across the U.S. approaching 1% of the population (DSM-5), topics regarding genetic and environmental influences on ASD, current appropriate diagnostic processes and measures, school curriculum accommodations and modifications, and consideration of co-morbid medical or other issues are addressed.

THE NEUROPSYCHOLOGY OF TOURETTE SYNDROME*

Diana B. Fuller, Jillian Karns

Faculty Advisor: Diane Tighe Cooke, Ph.D.

Tourette Syndrome (Gilles de la Tourette's syndrome) is a syndrome with childhood origins characterized by reoccurring vocal and/or motor tics. The neurological cause is the subject of current research. Theories hypothesize abnormalities in the cortico-striatal-thalamo-cortical pathway (Felling & Singer, 2011), putamen (Singer et. Al., 2002), basal ganglia (Felling & Singer, 2011), cortical thinning (Y. Worbe et al., 2010), and reduced connectivity of the fibers in the Corpus Callosum (Plessen et. Al., 2006). This poster explores the etiology, characteristics, medical treatment, insurance coverage, treatments, and educational considerations. Further, resources for TS are listed for both those with the syndrome and their families.

THE NEUROPSYCHOLOGY OF CONCUSSIONS: MILD TRAUMATIC BRAIN INJURY

Janelle Welsh

Faculty Advisor: Diane Tighe Cooke, Ph.D.

This poster presents comprehensive exploration into the neuropsychology of concussions, a mild form of traumatic brain injury that damages the brain's connective tissues and disrupts its normal functioning. When the head receives a blow or violent jolt, the resulting movement causes injury to the front and back of the skull, eliciting physical symptoms, psychological/emotional changes, cognitive difficulties, and behavioral patterns. These symptoms can impact student functioning and academic performance. According to the National Association of School Psychologists, due to the complicated nature of identifying neurological effects associated with sustaining a concussion, conducting computer-based pre- and post-concussion assessments are essential in preventing long-term learning difficulties and adverse effects on students' ability to complete school work and homework, and on their behavior (NASP, 2012). This poster describes the neurological changes associated with concussions. It encompasses prevention, identification, accommodation, and intervention to determine an appropriate return to learning.

CREATIVITY IN THE CLASSROOM: LITERACY AND SOCIAL STUDIES IN THE GRADE 2 CLASSROOM

Barbara Borowska, Jourdan Childs, Aislyn Cote, Jamie Delmonico, Kayla Donoghue, Heather Dziembowski, Holly Hollbrook, Lauren Kelleher, Cassie Kimball, Linda Kocibelli, Sarah Leidhold, Courtney Mirancer, Michelle Montville, Marie-Rose Pellegrino, Elizabeth Pyle, Marlene Ryder, Nicole Schofield, Alicia Serrato, Darlene Welch, Kirsten Wilcox

Faculty Advisor: Carol Donnelly, Ed.D.

As part of their pre-practicum experience, students in ED 340 Language Arts and Literacy in the Primary Grades teach a social studies lesson in a second grade at Tatnuck Magnet School once a week. They design lessons, create materials, implement lessons, and assess children's learning. Their work is based on the national Common Core State Standards, the Massachusetts Curriculum Frameworks, and the Department of Elementary and Secondary Education's Common Standards for Teachers. The members of ED 340 will share their lesson plans, materials, and experiences during this poster presentation.

DEVELOPING CULTURALLY COMPETENT SCHOOL PSYCHOLOGISTS: A CASE STUDY IN LATIN AMERICA*

Courtney Allain, Lauren Mello, Nicole Nowak, Amanda Polak, Victoria Sokoly

Faculty Advisor: Kirby L. Wycoff, Psy.,D, NCSP

This poster presentation will review a service-learning initiative that graduate students in the school psychology program are doing with a non-profit organization that provides orphan care in Mexico. According to the National Association of School Psychologists, students in graduate-level training programs must show competence in service delivery to culturally and linguistically diverse populations (Principles for Professional Ethics, 2010). By the year 2023, the U.S. Census Bureau (2008) predicts that over half of all children will be from minority groups. It is critical that future school psychologists be able to provide culturally competent interventions to all children served. In turn, there is significant need for institutionalized children in developing countries who are often exposed to inadequate psychological and medical care, minimal stimulation, and less enriched environments. Under the supervision of a faculty advisor, these needs have been brought together, and graduate students are contributing to the strengthening of service delivery for this at-risk, international population.

LEARNING ABOUT CULTURE AND DIVERSITY THROUGH CHILDREN'S LITERATURE

Annelese Bartlett, Brianna Harrington, Alexandra Raia, Eunice Dyer, Kendal Bergenholtz

Faculty Advisor: Christina Bebas, Ed.D.

A common issue in schools is that certain social groups are underrepresented in literature, on posters hung in school, in discussion, etc. It is rare to find a school with a focus on multicultural issues that assures that students within the school learn about various cultures and value diversity to its fullest. To address this problem, this group devised a plan while partnering with Tatnuck Magnet School in Worcester. The project began by talking with the principal and observing the school environment. The principal of this very diverse school noted that there was a lack of multicultural books and that the school struggled to incorporate lessons about culture and diversity. This poster presents a plan for a project that will hopefully help the students of Tatnuck Magnet School to be exposed to multicultural literature while also learning about five specific cultures.

PROMOTING MULTICULTURAL LITERATURE AT A LOCAL ELEMENTARY SCHOOL

Kaitlyn Tupper, Alyssa Cariglio, Laura Torres

Faculty Advisor: Christina Bebas, Ed.D.

This poster presentation describes a service project completed for ED 160, Early Childhood Education Today. The goal of the service project is to identify a problem that exists in an area school, learn about the problem, research potential solutions, and then implement a plan to help alleviate the problem. In order to provide multicultural books to Tatnuck Magnet School, books are being collected from local libraries through drop boxes. In addition, a fundraising night at Papa Gino's is being coordinated, and all the proceeds will go to purchasing multicultural books for the school. All the donated and purchased books will then be read with students at Tatnuck Magnet and then given to them to take home. This project addresses the "20 minutes a day" campaign already in place at the school. Our poster outlines the stages of the project.

USING MULTICULTURAL LITERATURE TO MOTIVATE CHILDREN TO READ

Dan Klien, Ly Truong, Toni Pham, Ayman Aude
Faculty Advisor: Christina Bebas, Ed.D.

In this poster session, a service project for ED 160, Early Childhood Education Today, will be described. The goal of this project is to help the school community at Tatnuck Magnet School by identifying a problem that exists in the school and then creating a plan to help alleviate the problem. After some research, this group discovered that Tatnuck Magnet School lacks multicultural books. In response to this problem, this group plans to increase the students' awareness of a myriad of cultures through literature by visiting the school twice a week to host an afterschool reading program. By performing this project, we will be embracing the school's goal to have students read 20 minutes a day. The goal is to engage the students in this topic and enhance their knowledge and awareness of diversity through literature and activities related to the reading.

MOTIVATING YOUNG CHILDREN TO READ

Courtney Vail, Alaina Martin, Danielle Dufault, Yvonne Hucknall, Mckayla Murphy, Stacy Mwangi
Faculty Advisor: Christina Bebas, Ed.D.

This presentation will describe a service project being carried out for ED 160: Early Childhood Education Today. The project consists of researching a problem in a school, setting goals for a project, considering resources, planning actions steps, analyzing outcomes, and reflecting on the project. After a discussion with the principal of Tatnuck Magnet School, it was clear that a major concern at the school is the lack of progress students are making related to literacy. In order to assist in resolving such literacy gaps, this group designed a project that exposes children to an alternative way of investigating literature. The plan involves the creation of what is called "The Literacy Tree." The goal is to create incentives for students to read recommended books for their age group. The poster being presented is a summation of the project.

PROMOTING ENVIRONMENTAL AWARENESS IN AN AREA SCHOOL

Krystal Anderson, Danielle Duquette, Juliane Pesoa, Nikita Aoude
Faculty Advisor: Christina Bebas, Ed.D.

In ED 160, Early Education Today, students are creating and implementing service learning projects that address issues in the area schools. As part of the project, students are asked to research a pertinent problem in a school, analyze solutions, and devise a plan to help. This group created a project that addresses the need for more environmental awareness and parental involvement at Tatnuck Magnet School. In order to help alleviate these issues, this group plans to decorate and provide recycle bins for the classrooms as well as conduct lessons related to plant life, with the end goal of creating a terrarium that students and parents will manage together. This poster session describes the various stages of the project.

GEOMETRY IN THE WORLD AROUND US: THE MATHEMATICS OF TESSELLATIONS

Sophia Gonet, Kara Walsh
Faculty Advisor: Raynold M. Lewis, Ph.D.

One of the objectives for elementary education students calls for their understanding of the principles and properties of transformational geometry. Transformational geometry is a topic in the elementary grades, and prospective teachers at Worcester State University are exposed to it in MA 132. This poster explores the history of Tessellations and their application in the world around us, the mathematics of Tessellations, and strategies that teachers can use to effectively teach this topic in a way that is both interesting and informative.

ENGLISH

PURITAN OF THE POST-WAR: JOHN BERRYMAN'S "HOMAGE TO MISTRESS BRADSTREET" AS A CRITIQUE OF COLD WAR AMERICA**

Christine Hickman**Faculty Advisor: Heather Treseler, Ph.D.**

While John Berryman was working on his long poem "Homage to Mistress Bradstreet" during the early 1950s - his self-proclaimed "rebuttal" to T.S. Eliot's *The Waste Land* - a number of factors were influencing his personal life and craft: his active epistolary correspondence with his mother, the contemporary literary landscape, and the maturation of his distinct poetic style. Even before Berryman's most famous work, *The Dream Songs* (1965), the poet used his resonance with Anne Bradstreet's poetry and biography to explore themes of integrity and corruption (in theology, American ideology, and morality), the struggle for identity in a conformist society, and the examination of the self. "Puritan of the Post-War" will examine these themes in addition to the relationships between sex, art, and politics of the Cold War era, as well as the poet's deconstruction of this time period's desperate efforts to "Americanize" the culture of the United States.

SUPERFLUOUS SINCERITY

Sarah Leidhold**Faculty Advisor: Heather Treseler, Ph.D.****A Commonwealth Honors Project**

I will present a compilation of my creative writing, mostly in the form of free verse poems on the theme of altruism and connectedness among human beings. Some of these poems were penned in fulfilling assignments for my "Creative Writing: Poetry" course and others were forged in the fires of inspiration, responding to the demand of a tireless muse. These pieces address a variety of topics, including prickly personal dilemmas, burgeoning political opinions, and stubborn stances of humanitarianism. I attempt to articulate my fledgling understanding of the portion of the world that I've experienced through metaphor, personification, dramatic monologues, allegories, and other poetic tools. These poems were selected from about fifty poems in my repertoire. I have no claim to brilliance, but I am practicing a craft that I respect deeply.

READING THE NON-READER: HOW STUDENTS WHO DO NOT READ SEE BOOKS**

Nick Duffy**Faculty Advisor: Karen Woods Weierman, Ph.D.****A Commonwealth Honors Project**

In my university library, it is more common to see a student scrolling Facebook than it is to see a student with a book. All college students are literate, but many are not literary. Those who do not read are blind to the advantages of reading. At the collegiate level, students have been in school long enough to hear the "good word" about books. Thus, professors may not be sensitive to the bias of the non-reader, who should not be ignored. Drawing from the testimonies of 10 college students who are reluctant readers, I will present their qualms about the practice so that advocates of literature can learn from their perspective. College may be the last chance these students have to develop lifelong reading habits. Professors should be interested in the non-readers because understanding their outlook can help the professor engage the entire class. My project will give the students who do not participate in book discussions a chance to explain why they do not. I will organize their testimonies and highlight similarities found in their opinions. If we can better understand why these students do not read, perhaps we can change their minds.

HAMLET'S HEART OF DARKNESS**

Steven Connors

Faculty Advisor: Heather Treseler, Ph.D.

In "Hamlet and His Problems," T. S. Eliot writes that "Hamlet...is full of some stuff that the writer could not drag to light, contemplate, or manipulate into art." Moreover, he finds in Shakespeare's characterization of Hamlet an inability to construct a reciprocal stimulus—an "objective correlative" (Eliot)—to which one could rightfully attribute Hamlet's emotions. However, the essence of Hamlet's existential questioning and vexation is not exclusive to this one play. One finds this essence in Joseph Conrad's *Heart of Darkness*. Conrad's character, Marlow, muses upon similar premises as Shakespeare's Hamlet. Furthermore, creeping within both characters is a latent atheism, which is adumbrated by their musings upon the disparity between presence and absence, life and death; Jacques Derrida's essay "Structure, Sign and Play" enforces this assertion. The pending horror of death's mystery, which is a product of language rather than of objective reality, entralls both characters hauntingly.

HEALTH SCIENCES

CAFFEINATED BEVERAGES CONSUMPTION HABITS AND PERCEPTIONS IN WSU STUDENTS

Samantha Hynes

Faculty Advisor: Mariana Calle, Ph.D.

The effects of caffeine on sleep and physical performance in older adults and children aged 12-17 has been largely studied. However, studies looking specifically at the effects on academic performance in college students are scarce. This undergraduate, cross-sectional pilot study aims to examine WSU student's benefit/risk analysis of the effects of their caffeinated beverage consumption related on their perceived effects, sleep patterns and academic performance. Specifically, this study intends to examine the following: students' reported reasons for consuming caffeinated beverages; students' perception of health risk and/or health benefits of consuming caffeinated beverages and students' perception of effects on post-10 p.m. consumption of caffeinated beverages. An anonymous survey will be administered via e-mail to all WSU students. After the data are collected and analyzed using descriptive statistics, the results will be presented as a poster.

COULD SINGLE-PAYER HEALTH CARE BE A REALITY IN THE UNITED STATES?***

Breeyn Green

Faculty Advisor: Michelle White, Ph.D.

With the passage of the Affordable Care and Patient Protection Act of 2010, national health care became a central political issue. Immediately, there was push-back from all sides. The authority behind the insurance mandate, the accessibility of the health care exchanges and the government's lack of foresight remain the focuses of debate. Here is the question on everyone's mind: Is there a better alternative? The answer: Yes! The state of Vermont has recently reformed their health care system with the passage of H. 202, effectively creating a single-payer system. Could a similar system work in other states? This presentation will look at how this state-wide change occurred and the possibility of national implementation of a universal health care system. It will present the results of an ongoing research project examining single-payer developments across the U.S. This study involves original research with Vermont's legislative database, using content analysis from 1985 onward.

HISTORY

THE WOMEN OF THE BEAT MOVEMENT**

Laura Sutter

Faculty Advisor: Tona Hangen, Ph.D.
A Commonwealth Honors Project

In the 1950s, the Beat literature of Jack Kerouac, Allen Ginsberg, and William Burroughs was becoming a part of popular American culture. Their works have remained a staple in studying the counterculture created in Greenwich Village, New York during this time. However, there also were women who published novels and poetry in the Beat style that have gone unrecognized. This paper argues that the definition of Beat created by Jack Kerouac excluded women from being a part of the movement and its history. Using a variety of primary sources such as interviews, writing samples by Beat women, and past historical interpretations of Beat culture, I analyze the term Beat. I construct a definition of Beat as both a lifestyle and a writing style by compiling earlier definitions used by a variety of Beats. I examine the lives and works of Diane di Prima, Joyce Johnson, and Hettie Jones to argue that they were Beats in that they followed the same lifestyles and writing styles of their male counterparts. These women deserve to be recognized as an integral part of this literary movement.

THE INVISIBLE PEOPLE OF THE 1950s: EXPLAINING THE CAUSE OF POVERTY DURING PROSPERITY**

Jean Cabral

Faculty Advisor: Tona Hangen, Ph.D.

Too often in history, social and cultural changes cause groups of people to be disadvantaged. The issue of structural poverty in the 1950s is no different. The decade is commonly associated with prosperity and advancement, but the conditions of the era created a problem so large that by 1960 nearly a third of the nation's children were poor. And even though 36% of the population was estimated to be living at or below the poverty level, the problem went unnoticed until 1961, when Michael Harrington published *The Other America: Poverty in the United States*. The rise and expansion of the middle class distracted the country from the poverty issues their new culture created. The focus of my research—and presentation—is to identify the unexpected causes of poverty and its correlation to the prosperity the rising middle class in America.

MATHEMATICS

THE UNIVERSAL FIBONACCI SEQUENCE**

Jason A. Green

Faculty Advisor: Hy Ginsberg, Ph.D.

The sequence of Fibonacci Numbers has many special properties. Another sequence with similar properties is the sequence of Lucas Numbers. During my presentation, I will discuss how these sequences are part of a much larger family of sequences that have these properties in common.

ZOMBIE ATTACK: A MATHEMATICAL SIR MODEL

Samantha D'Ascanio, Christopher Hanson

Faculty Advisor: Susan Schmoyer, Ph.D.

We describe a mathematical model for the spread of a given infection, otherwise known as the SIR model for infectious diseases. This model uses the method of matrices and linear algebra to describe the number of susceptible, infected, and recovered members of the population. In the primary example, we apply the SIR model to the ever-dreaded “zombie attack.”

ACTUARIAL MATHEMATICS AS A CAREER

Lisa Snay

Faculty Advisor: Maria Fung, Ph.D.

As a senior mathematics major concentrating in statistics and modeling, my capstone project was to study some of the basic topics in preparation for the second actuarial exam, Financial Mathematics. This poster outlines the actuarial career and the academic work required to become an actuary.

COMPARING POLYNOMIALS IN HIGH SCHOOL AND IN AN ABSTRACT ALGEBRA COURSE

Honguyen Cao

Faculty Advisor: Maria Fung, Ph.D.

My poster will compare and contrast the notion of a one-variable polynomial in the high school curriculum and in abstract algebra. I will discuss the similarities and differences in definitions, properties and results.

CLIMATE CHANGE IN WORCESTER

Nicholas Nelson

Faculty Advisor: Maria Fung, Ph.D.

For this poster presentation, we consider yearly mean temperature data from 1949 to 2012 from the Worcester Regional Airport. This analysis gives evidence of Worcester's average temperature being on the rise. We relate the change in the mean temperature to the change in standard deviation that can explain some of the extreme weather conditions we have been observing lately.

CRYPTOGRAPHY: THE RSA ENCRYPTION SYSTEM

Kristyn Mangini, Nicole Erickson

Faculty Advisor: Michael Winders, Ph.D.

This poster explores the idea of cryptography and the RSA (Rivest Shamir Adelman) encryption system. Cryptography is the branch of science concerned with the development and analysis of procedures used to encode and decode information. Through the use of the RSA system, which is a public-key system, we will demonstrate how to encrypt a message for another group and then how to decrypt a message. Encryption and decryption involves the use of number theory.

RSA ENCRYPTION

Stefanie Creagh, Sarah Grimes

Faculty Advisor: Michael Winders, Ph.D.

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 in the real world. How times have changed! With the advent of high-powered computers, Number Theory is currently one of the most applied branches of mathematics. For our poster, we used our knowledge from Number Theory to explain RSA (Rivest Shamir Adelman) encryption, which is used to communicate information in a secure manner through coding and decoding. The study of RSA encryption was originally used for military intelligence, but due to the increasing need for security of information, it is used by many businesses.

FROM “PRIME” TO “PRIVACY”: HOW DOES RSA WORK?

Hongyen Cao, Huong Doan**Faculty Advisor: Michael Winders, Ph.D.**

In this modern world, privacy is necessary in every aspect of life. From entering a password for your email to the PIN for your ATM card, high security is required in order to protect your personal information. Therefore, cryptography, the practice and study of techniques for secure communication in the presence of third parties, is an important tool for combating the influence of adversaries and is related to various aspects in information security. The methods used to carry out cryptology have become increasingly complex and its application more widespread. For this poster, we investigated the RSA (Rivest Shamir Adelman) public-key system. The success of RSA is based on the practical difficulty of factoring very large numbers into two prime factors. RSA is one of the first practicable public-key cryptosystems and is widely used for secure data transmission.

THE FREE-THROW PROBLEM

Nathen Wheeler**Faculty Advisor: Hy Ginsberg, Ph.D.**

Imagine if you will a basketball player who misses her first free-throw attempt, but thereafter possesses the ability to make or miss free-throws at will. Can this player achieve a free-throw percentage of higher than 80% without ever having a free-throw percentage of precisely 80%? For my poster presentation, I answer this question in the negative and investigate related questions pertaining to the study of mathematical sequences.

TRISECTING AN ANGLE

Marie Jezierski, Brittany Rivard**Faculty Advisor: Michael Winders, Ph.D.**

Bisecting an angle is a manageable task that is often performed in high school classrooms using an unmarked straightedge and a compass. However, a problem arises when trisecting an angle. In fact, it is impossible to trisect a 60-degree angle with an unmarked straightedge and a compass. Wantzel proved the impossibility of the problem in 1836. Based on a theorem in abstract algebra, a 60-degree angle cannot be trisected since there does not exist a rational root solution of a certain cubic polynomial equation.

PROVING THAT TRISECTING AN ANGLE IS IMPOSSIBLE

Nicole Erickson**Faculty Advisor: Michael Winders, Ph.D.**

Angle trisection is a classic problem of compass and straightedge constructions of ancient Greek mathematics. It concerns construction of a given arbitrary angle, using only two tools: an unmarked straightedge and a compass. The problem as stated is generally impossible to solve. The proof that straightedge and compass trisection is impossible is usually done using algebraic methods. These algebraic methods rely heavily on abstract algebra, thus, for my poster presentation, I will use principle ideas and theorems from abstract algebra in order to prove that trisecting an angle is impossible using only an unmarked straightedge and a compass.

RELATIONSHIP BETWEEN OVERALL HIGH SCHOOL GPA AND PERFORMANCE IN THE WORCESTER STATE UNIVERSITY HONORS PROGRAM

Karolina Jakobkiewicz
Faculty Advisor: Maria Fung, Ph.D.
A Commonwealth Honors Project

The purpose of this study was to determine whether or not the GPA requirement for incoming freshmen students looking to enroll in the Worcester State University Honors Program should be increased. Initial research suggested that the GPA requirement should indeed change, and a careful analysis of the data confirms that to be true. The project includes a closer look at student GPAs over the course of four years at Worcester State and how they changed, in connection with the students' high school GPAs.

NURSING

HEART SCREENINGS IN YOUNG ATHLETES IDENTIFY RISK FACTORS FOR SUDDEN CARDIAC ARREST*

Karen Tougas
Faculty Advisor: Stephanie Chalupka, Ed.D., RN, PHCNS-BC, FAAOHN

Sudden cardiac arrest (SCA) in the young is the leading cause of death in the United States, afflicting over 300,000 individuals each year. SCA is also the leading cause of death in exercising young athletes during sports participation and typically the result of undiagnosed structural or electrical cardiovascular disease. Sports physical exams that include cardiac screening (EKG, cardiac ultrasound, if warranted, and review of family heart history) will assist in identifying those young athletes most at risk for a sudden cardiac arrest. This poster identifies the leading causes of SCA in exercising youth and raises awareness of the interventions that can be implemented to keep youth safe.

UTILIZING HEALTHY PEOPLE 2020 OBJECTIVES TO TEACH ENVIRONMENTAL HEALTH TOPICS*

Lisa Chan
Faculty Advisor: Stephanie Chalupka, Ed.D., RN, PHCNS-BC, FAAOHN

The Healthy People 2020 Environmental Health Objective challenges us to reduce chemical exposures in our environment that may be contributing to adverse health effects such as cancers, cardiac diseases, asthma, and other endocrine disrupting conditions. Low-dose, repeated exposure from chemicals in our everyday environment affects the health of the general population as well as vulnerable populations. These threats to health burden individuals and contribute to rising healthcare costs. By linking frontline providers such as nurses, physicians, and public health workers with experts in the environmental field, professionals can acquire the latest, up-to-date information, and learn about best practices. More than 100 people attended a Toxins & Your Health Workshop and learned about environmental risks related to indoor air quality, strategies to teach health promotion and risk reduction, and how to make appropriate referrals. Fifty percent signed evaluation postcards pledging to translate this new information into personal and professional practice. This poster presentation will review these efforts to raise awareness of health effects related to chemical exposures. In addition, this research was presented at the 2014 Association for Prevention Teaching and Research conference in Washington, D.C.

BRIDGING COMMUNICATION GAPS WITH THE DEAF*

Gregory Shuler
Faculty Advisor: Stephanie Chalupka, Ed.D., RN, PHCNS-BC, FAAOHN

This poster presents an overview of the laws and rules created to improve access to communication for people who are deaf or hard of hearing. Besides describing various modes used to improve communication, the poster provides a deeper understanding of best practices for effective communication with patients who are deaf or hard of hearing.

 HPV KNOWLEDGE AMONGST COLLEGE STUDENTS AND THE EFFECTIVENESS OF A HEALTH EDUCATION PILOT STUDY*

Brittany Tolman

Faculty Advisor: Stephanie Chalupka, Ed.D., RN, PHCNS-BC, FAAOHN

Human Papillomavirus, or HPV, is a virus that infects the anogenital area, mouth, and throat. HPV is the most common sexually transmitted infection and currently affects 79 million Americans, 44.8% being young adults between the ages of 20 and 24. Currently, there is no cure for HPV, and condoms only lower HPV infection rates by 70%. The aim of this study was to pilot an education program at Worcester State University for students about HPV, the benefits of receiving the vaccination, and safe sex practices. As a result, HPV vaccination rates and knowledge should improve. This study utilized 60 undergraduate students between the ages of 18 and 24 at Worcester State and provided them with different education forums: a 10-minute classroom discussion and an HPV awareness week with events. The students' level of HPV knowledge and vaccination rate will be examined by a pre- to post-survey. This poster presents results of student surveys pre- and post-interventions.

BEDSIDE SHIFT REPORT: ENHANCING THE PATIENT EXPERIENCE*

Judymae Ofori-Atta

Faculty Advisor: Stephanie Chalupka, Ed.D., RN, PHCNS-BC, FAAOHN

When the research shows that sentinel events (unexpected occurrence involving death or serious injury) occur more frequently during the "alone" time period, it's time to be proactive and move nurses away from the nurses' station and take them to the patients' bedside for the shift report. Between 210,000 and 440,000 patients who go to the hospital each year for care suffer some kind of preventable harm that contributes to their death. Therefore, the Bedside Shift Report can save lives. Patients are aware of the change of shift report time; they know that for approximately 1-2 hours they are basically "alone." The Bedside Shift Report has eliminated that "alone" time, and the patient is now actively involved in their care. The concept of the off-going nurse and the on-coming nurse taking shift report to the bedside has many benefits for the nurse and patient, the most important is the creation of an environment of safety. This poster presents the benefits of Bedside Shift Report for nursing staff and its potential to improve patient safety.

THE EMOTIONAL STRESS ON NURSES CARING FOR TERMINALLY ILL PATIENTS*

Susan Charest

Faculty Advisor: Stephanie Chalupka, Ed.D., RN, PHCNS-BC, FAAOHN

When caring for terminally ill patients, nurses have to deal with the emotional stress of the situation. Little is known to what degree nurses endure emotional stress and what strategies they use to deal with it. In reviewing literature on this subject, it has been discovered that palliative care and hospice nurses actually have lower levels of emotional stress dealing with terminally ill patients as compared to nurse working in acute medical settings and critical care nurses. It has been found that palliative care and hospice nurses use strategies to prevent them from "burn out" in these stressful situations. If nurses are emotionally stable and balance their professional life and their personal life, they are less likely to develop professional compassion fatigue and are able to deliver safe care to their patients. This poster describes the dimensions of stress in the working environment and strategies for effective coping.

STAFF NURSES PERCEPTION OF NURSING LEADERSHIP*

Edward Adu-Gyamfi

Faculty Advisor: Stephanie Chalupka, Ed.D., RN, PHCNS-BC, FAAOHN

Recent surveys of new nurses have uncovered how they intend to leave the profession within the first year due to peer bullying, no help from nursing leadership/management and a disconnection from nursing leadership, which is of great concern. With the pending issue of nursing shortage and the aging population, nursing as a profession needs to have solutions in place. A literature review was done looking at staff nurses perception of nursing leadership/management. There was a

paucity of information. There needs to be more research on evidenced-based knowledge/solutions. Nursing as a profession would be in a better position to help improve collaboration among nurses to reach the utmost goal of maintaining staff nurses retention, preserve their commitment to the profession and eventually improve patients and community outcomes. This would eventually promote the image of nursing as a profession. This poster presentation highlights the need for more empirical research on staff nurses' perception of nursing leadership and what nursing as a profession can do to maintain collaboration within the profession.

REHABILITATION CHALLENGES WITH THE HEMIPLEGIC POSTPARTUM, BREASTFEEDING MOM*

Augusta Ishola

Faculty Advisor: Stephanie Chalupka, Ed.D., RN, PHCNS-BC, FAAOHN

Rehabilitative nursing care of a stroke patient is often challenging, but when the patient is a hemiplegic and postpartum mom hoping to breast feed her newborn baby, the challenges increase. A typical stroke patient has functional problems with self-care, mobility, incontinence, and coping. My research found that these problems were exacerbated by the patient's wish to breast pump. Multiple socioeconomic issues also added to the complexity of this case. One of the biggest challenges encountered in the patient's care was the difficulty of finding what drugs were safe for lactating mothers. The Food and Drug Administration and Center for Disease Control websites had little information on contraindicated medications for lactating mothers or breast milk storage. The patient also could not breast pump independently. Using a multidisciplinary approach, we were able to help the patient achieve her goals of pumping. The team also successfully put a program together to meet the patient's rehabilitation needs. This poster addresses the unique needs and challenges related to the care and treatment of rehabilitating postpartum stroke patients.

MILITARY-CIVILIAN PREPAREDNESS AND MANAGEMENT OF RADIOLOGICAL CASUALTIES FOLLOWING A RADIOLOGICAL INCIDENT*

Brooke J. Marsh

Faculty Advisor: Stephanie Chalupka, Ed.D., RN, PHCNS-BC, FAAOHN

The process of developing a response plan to a radiological incident and the co-management of medical treatment to an exposed population is imperative for first responders, the exposed, and health care providers. The Department of Defense, local response teams, and policy-planning members require an expert understanding and working knowledge for minimizing exposure, medically treating, and maintaining public safety during the management of a radiological event. In the event of radiological exposure, the ability of physicians; nurses; chemical, biological, radiological and nuclear explosive (CBRNE) specialists; medical planners; and first responders to respond, treat, and manage casualties requires technical training to protect themselves and others. Becoming familiarized with the effects of radiological/nuclear weapons, radiological terrorism, and radiation emitting accidents, as well as the psychological effects of nuclear detonation, both real and perceived, are all components that require an appropriate response, protecting and limiting harmful radiological exposure. This poster presentation will represent a co-developed response and management operation for a radiological event.

MITIGATING THE IMPACT ON EMERGENCY RESPONSE SYSTEMS THROUGH INDIVIDUAL PREPAREDNESS*

Keith A. Foster

Faculty Advisor: Stephanie Chalupka, Ed.D., RN, PHCNS-BC, FAAOHN

Preparing for an emergency can be simple. Getting people to properly prepare is the challenge. This poster presentation will describe how household emergency preparedness can be implemented. There are steps that can be taken to drastically improve outcomes such as having a plan. The process of providing awareness through educational means and demonstration has encountered some limitations. Several organizational campaigns by the Center for Disease Control (CDC), Ready.gov, and World Health Organization (WHO) have been able to improve awareness of community household preparation, including a three-day supply of food, water, and medication. However, they have been unable to increase established household emergency evacuation plans. An established and practiced evacuation plan has been an unappreciated aspect of household emergency preparedness. Examining means to better promote community awareness of this underdeveloped aspect in emergency preparedness is required in order to mitigate the impact on emergency response systems and to more effectively serve the community.

PHILOSOPHY
A MOTHER'S RIGHT TO LIFE****Tiara N. Yahnian****Faculty Advisor: Henry Theriault, Ph.D.**

The mainstream view of the right to life allows for the termination of a possible life assuming that the mother's life is at risk. However, there is little to no discussion about cases in which preserving the mother's life depends on her having a malformed baby. This paper will examine the moral implications of the similarities and differences between those cases as well as question the extent to which a mother may go to protect her right to life.

PHYSICAL AND EARTH SCIENCES
TIMBERRR!: TIMBER HARVESTING PATTERNS AND PRACTICES IN MASSACHUSETTS**George Andrews****Faculty Advisor: Allison Dunn, Ph.D.****A Commonwealth Honors Project**

Massachusetts is a heavily forested state, and the majority of that forest is privately owned. By studying the land-use and timber harvesting of 38 towns in eastern and central Massachusetts, we can garner a sense of what kind of an effect human activity is having on these privately owned forests and their ability to produce valuable timber resources. For the study, we researched and analyzed thirty years of timber harvesting in Massachusetts using ArcGIS to geo-reference government required forest cutting plans. Using the data, maps were created to indicate the changes and trends in harvesting activity within our selected transect towns. Analyses show that harvesting activity has decreased over time; though harvesting intensity has increased in the western transect towns. Maps created from the forest-cutting plans offer an utterly unique geospatial record of timber harvesting and help define the relationship between humans and the forest they "own."

CONTROLS ON THE INFILLING OF LACUSTRINE BASINS: INFERENCES AND UNCERTAINTIES FROM A REGION STUDY OF LAKES IN THE NORTHEASTERN UNITED STATES
Taylor Nelson**Faculty Advisor: Timothy Cook, Ph.D.**

The rate of sediment infilling in lacustrine basins is controlled by a variety of factors related to processes acting within a lake and in the surrounding environment, including water chemistry, aquatic productivity, climate, land-use, lake and watershed morphology, human activity, and the legacy of past geologic events. Quantifying the impact of any one of these factors requires examining records of sediment infilling from a wide variety of lakes of differing characteristics and over time periods relevant to both human-induced changes and longer term, natural variability related to climatic and landscape changes. For our poster presentation, we have approached this topic by compiling existing records of sediment age-depth relationships from lakes located throughout New England. These records provide insight into geographic, morphologic, climatic, and anthropogenic controls on lake sedimentation while also highlighting limitations of existing sedimentary records and remaining uncertainties in our understanding of the depositional history of lacustrine basins in the northeastern United States.

WORCESTER AND THE CLARK INDEX: BICYCLE FEASIBILITY STUDY FOR U.S. CITIES WITH A POPULATION UNDER 200,000
Michael Gallotta**Faculty Advisor: William Hansen, Ph.D., Stephen Healy, Ph.D.**

A growing number of Americans have adopted a bicycle into their daily commute because of its simplicity and sustainability. In older cities, such as Worcester, the transportation infrastructure is not welcoming to bike traffic, and lacks the necessary

facilities to safely accommodate this growing number of bicycle commuters. In order to encourage more people to ride their bikes, Worcester must reevaluate the design of its roadways to offer cyclists access to safe routes leading across the city—mirroring the radical changes seen in other US cities, such as Davis, Calif. A geographic information system (GIS) study was conducted using the “Clark Index,” to quantify the safety of each segment of road, based on a number of attributes from the Massachusetts Department of Transportation. Ultimately, indexing the streets of Worcester for “bicycle feasibility” will help city officials to take appropriate action to protect the dynamically growing bicycle ridership.

THE IMPACT OF URBANIZATION AND LAND-USE CHANGE ON CARBON CYCLING DYNAMICS ALONG AN RURAL-TO-URBAN GRADIENT IN MASSACHUSETTS

Nicole Volk

Faculty Advisor: Allison Dunn, Ph.D.

Land-use change associated with urbanization adversely impacts vegetation growth patterns, affecting local carbon cycling. Quantifying these impacts could inform the development of more ecologically sustainable urban areas. Field work was conducted in 135 sites along a rural-to-urban gradient in Massachusetts that underwent different forms of land-use change since 1971. In order to determine carbon content, we took samples and/or measurements of ground cover, tree canopy, leaf litter, foliage, trees, soil, and coarse woody debris. The data was interpreted by analyzing the percent of tree canopy, number of tree stems, number of tree genera, and the amount of carbon in living biomass in relation to the type and time of land-use change. The results reveal how different types of land-use change events impact carbon cycling, including the temporal trajectory of carbon sequestration in future decades.

PRECIPITATION CHANGES IN EAST ANTARCTICA GIVEN A DIMINISHED WEST ANTARCTIC ICE SHEET

Dominique A. Seles

Faculty Advisor: Douglas Kowalewski, Ph.D.

Ongoing studies suggest a collapse of the West Antarctic Ice Sheet (WAIS) during an unusually warm interglacial 1.1 million years ago (Marine Isotope Stage 31). However, it appears the larger East Antarctic Ice Sheet remained intact during this time. I propose that snowfall in East Antarctica, in particular the Transantarctic Mountains that dissect the East and West Antarctica Ice Sheets, was sufficient for sustaining glaciation during this interglacial. A high-resolution regional scale climate model (RegCM3) was used to run simulations for present day and paleo-climatic conditions to assess changes in precipitation (and temperature) provided a loss of WAIS during Marine Isotope Stage 31. Initial modeling results suggest that with an interglacial orbit and the removal of WAIS, the Transantarctic Mountains received increased annual precipitation with only a minimal rise in summertime mean atmospheric temperature. These findings support the persistence of cold polar conditions and glaciation in sectors of East Antarctica.

INFLUENCE OF INCREASED METHANE ON SEA ICE DISTRIBUTION IN POLAR REGIONS

Brittnee Bleau

Faculty Advisor: Douglas Kowalewski, Ph.D.

Global sea ice distribution has been decreasing since the 1970s. This decline of sea ice has been contributed primarily to warming from increased atmospheric carbon dioxide. Current studies have focused on predicting sea ice distribution as a function of increasing CO₂. However, it has been shown that methane may have 30x the warming capacity of CO₂. Here, I investigate the influence of increased methane on sea ice distribution. This study uses the EDGCM model to predict melt potential of global sea ice as methane is doubled (from 1.7 ppm to 3.4 ppm) over the next century. The modeling results suggest that there is a significant decrease in spatial ice distribution annually with a doubling of methane with greater change in the Arctic. The compilation of both doubling scenarios results in severe Antarctic and Arctic melt, concluding that the sensitivity of sea ice is heavily dependent on these powerful greenhouse gasses.

BIOGEOGRAPHY AND TAXONOMIC REVISION OF THE GENUS NUNCIA OF NEW ZEALAND

Kelly Cutting**Faculty Advisor: Sebastian Velez, Ph.D., Stephen Healy, Ph.D.**

The genus *Nuncia* belongs to Triaenonychidae, an important but understudied family of Opiliones within the class Arachnida. There are currently 54 described species of *Nuncia* in New Zealand. The genus presents a challenge to taxonomists, since its recent diversification has not allowed for the evolution of diagnostic morphological character states among the species. The only comprehensive taxonomic work of the group, Raymond R. Forster's 1954 monograph, contains many errors, including ambiguous and poorly described diagnostic characters. In this poster, I present the results from images taken using focus-stacking macrophotography techniques to aid in the identification process of specimens housed at Harvard University's Museum of Comparative Zoology. In addition, this study geocodes the location of specimens in the Harvard laboratories and the samples originally used by Forster. This research is being utilized to compare members of the group to make a multidimensional morphological and molecular based revision to the taxonomy of the genus.

A LONG-TERM PERSPECTIVE ON TROPICAL STORM IRENE AND THE OCCURRENCE OF EXTREME GEOMORPHIC EVENTS BASED ON FLOOD-INDUCED DEPOSITS IN AMHERST LAKE, VERMONT

Timothy Cook, Ph.D.

Large floods are by their very nature infrequent events. Nonetheless, the potential for significant damage to property and infrastructure as well as the threat to human lives associated with these events underscores the importance of understanding the factors which influence their occurrence and frequency. Historical records are typically inadequate for accurately constraining the recurrence interval or identifying trends in the occurrence of extreme events. In contrast, natural geologic archives extending beyond the historical period can provide important constraints on the occurrence of extreme events in the past. This project describes results from an examination of the sedimentary record preserved in Amherst Lake, Vermont, which is sensitive to flood deposition from the Black River. This record includes a prominent deposit from Tropical Storm Irene along with heretofore unidentified event deposits from earlier in the 1900s, which distinguish the 20th century as a period of anomalous flood activity relative to previous centuries.

GAMMA-RAY SPECTROSCOPY STUDY OF BRACHYTHERAPY SAMPLES

Travis Holbrook**Faculty Advisor: Sudha Swaminathan, Ph.D., (WSU) and David Medich, Ph.D. (WPI)**

Brachytherapy is a form of radiation therapy in which cancerous cells are targeted with the gamma rays produced when radioactive nuclei decay. Radioactive nuclei are characterized by their activity (number of decays per second), their half-life (time taken for half of a given number to decay), and the amount of energy they deposit in tissue per unit tissue mass (absorbed dose). Brachytherapy sources typically include radioactive nuclei with high activities and short half-lives. The sources can contain impurities, which lead to a larger dose of radiation to the targeted area than was expected. Chemical elements present in the impurities can be identified by examining their gamma-ray spectra. In this study, three brachytherapy samples were analyzed using gamma-ray spectroscopy in order to determine the presence and activity of any long- half-life impurities within the samples.

PSYCHOLOGY

GREAT EXPECTATIONS: PERFECTIONISM AND LOCUS OF CONTROL AS COMBINED SOCIAL-COGNITIVE PREDICTORS OF COLLEGE ADJUSTMENT

Samuel O. Lapoint**Faculty Advisor: Champika K. Soysa, Ph.D.**

We investigated dimensions of locus of control and recently-identified aspects of perfectionism as social-cognitive predictors of college adjustment (academic, social, personal-emotional, and institutional attachment) among 174 undergraduates. Dissatisfaction (inversely) and high standards, both aspects of perfectionism, most consistently predicted college adjustment, which could inform institutional retention efforts. A poster on this research was presented at the Association for Psychological Science annual convention in Washington, D.C., in May 2013.

DISSATISFACTION AND HIGH STANDARDS, NOT LOCUS OF CONTROL, PREDICT STRESS AND WELL-BEING

Samuel O. Lapoint

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

We examined perfectionism (high standards, dissatisfaction, black-and-white thinking, and reactivity to mistakes) and locus of control (internality, powerful others, and chance) in predicting stress and well-being among primarily first-generation college students (N = 195), a population largely understudied in the psychology literature. Dimensions of perfectionism predicted stress (dissatisfaction, reactivity to mistakes, and high standards) and well-being (dissatisfaction and high standards), while aspects of locus of control did not. It appears that perfectionism accounted for LOC in predicting stress and well-being. The poster on this research was presented at the American Psychological Association annual convention in Honolulu, Hawaii, in August 2013.

AN EXAMINATION OF THE RELATION BETWEEN ACADEMIC ENTITLEMENT AND ACADEMIC MOTIVATION

Colleen Sullivan, Ph.D., Amberly Bliss, Jennifer Jackson

Faculty Advisor: Colleen Sullivan, Ph.D.

Students' emphasis on receiving an undergraduate degree and above average course grades has risen above "learning for the sake of learning." This study examined the relation between academic entitlement and academic motivation among a sample of Worcester State University undergraduate students. Online survey data collection was used. As expected, students who had entitled expectations, such as receiving a passing grade regardless of work effort, reported higher levels of achievement goal orientations that focused on receiving a high grade (i.e., performance-approach) and avoiding a misunderstanding of material (i.e., mastery-avoidance). Additionally, higher levels of entitled expectations were inversely related to valuing a course task and a belief in one's ability to be academically successful. These results provide preliminary evidence that academic motivation and classroom learning may be influenced by students' expectations of paying for an academic service, faculty requirements, and effort needed for a satisfactory grade.

ANALYZING THE RELATIONS BETWEEN ACADEMIC MOTIVATION, LEARNING STRATEGIES, AND ACADEMIC PERFORMANCE

Colleen Sullivan, Ph.D., Amberly Bliss, Jennifer Jackson

Faculty Advisor: Colleen Sullivan, Ph.D.

To be academically successful in a university setting, students must demonstrate both academic motivation and the use of appropriate learning strategies to set themselves apart from others. In this study, adaptive forms of academic motivation and learning strategies were expected to positively influence academic performance. Undergraduate students completed online questionnaires, and their GPA was accessed with their consent. Preliminary evidence suggests that adaptive motivational goals, values, and beliefs were positively related to deep-processing forms of learning strategies (i.e., metacognitive self-regulation, organization, effort regulation, critical thinking, and elaboration) and time-management abilities. The results show that in a highly competitive university setting, academically motivated students who apply these learning strategies will likely experience greater success throughout their academic career.

MINDFULNESS AND SELF-COMPASSION, BUT NOT SELF-EFFICACY, PREDICT DEPRESSION AND ANXIETY: GENDERED PATTERNS

Carolyn J. Wilcomb

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

We investigated predictors of depression and anxiety in 148 undergraduates for this project. Aspects of mindfulness and self-compassion, but not self-efficacy, were predictors of depression and anxiety in both male and female college students. Our findings may inform symptom prevention programs for undergraduates. This poster was presented at the Association for Psychological Science annual convention in Washington, D.C., in May 2013.

 TEACHING THE PSYCHOLOGICAL DIMENSIONS OF MINDFULNESS BENEFITS PUBLIC AND PRIVATE COLLEGE STUDENTS

Champika K. Soya, Ph.D., (WSU) Keith Lahikainen, Psy.D. (Assumption College)

Mindfulness is a component of an internationalized psychology curriculum. Shared and non-shared facets of mindfulness predicted well-being in public (N = 86) and private (N = 88) college students. The ability to identify facets of mindfulness and a willingness to use mindfulness increased after a teaching module, with a greater increase in the latter at the public institution. This research poster was presented at the Teaching Institute of the Association for Psychological Science annual convention in Washington, D.C., in May 2013.

PSYCHO-EDUCATIONAL OUTCOMES IN UNDERPRIVILEGED STUDENTS: CULTURAL CAPITAL AND SELF-ESTEEM

Champika K. Soya, Ph.D. (WSU), Samuel Lapoint (WSU), Keith Lahikainen, Psy.D. (Assumption College), Paula Fitzpatrick, Ph.D. (Assumption College), Colleen McKenna (WSU)

We investigated self-esteem and cultural capital as predictors of academic adjustment, social adjustment, well-being, and stress among 170 undergraduates. In Study One, self-esteem and cultural capital (self) predicted academic adjustment and well-being. Further, self-esteem and cultural capital (parents) predicted social adjustment. Also as predicted, self-esteem inversely predicted stress. In Study Two, we found that cultural capital for self and parents alike were higher in students from a private college compared to a public university, as predicted. These results could inform service delivery for underprivileged undergraduate communities. This research poster was presented at the American Psychological Association annual convention in Honolulu, Hawaii, in August 2013.

WRITING IN INTRODUCTORY PSYCHOLOGY: TEACHING TEXT, TECHNOLOGY, AND TRANSDISCIPLINARITY

Champika K. Soya, Ph.D. (WSU), Paula Fitzpatrick, Ph.D. (Assumption College)

We evaluated two assignments where students built connections between their everyday psychological experiences and Introduction to Psychology. We identified student learning outcomes (SLOs) based on the American Psychological Association (2011) goals for the undergraduate curriculum in psychology. We presented assessments of those SLOs using grading rubrics for each assignment, and we concluded by linking our SLOs to the proposed revisions of the goals for the undergraduate curriculum in psychology. In these ways, students in Introduction to Psychology learned the beginnings of psychological literacy. This research poster was presented at the American Psychological Association annual convention in Honolulu, Hawaii, in August 2013.

SELF-EFFICACY AND PERFECTIONIST DISSATISFACTION, BUT NOT SELF-ESTEEM, PREDICT COLLEGE ADJUSTMENT

Champika K. Soya, Ph.D., Samuel Lapoint, Alison Kahn, Carolyn Halfpenny, Kathryn Fant, Gaelen Chinnock

We examined self-esteem, self-efficacy, and perfectionist dissatisfaction as predictors of four types of college adjustment in 142 undergraduates. In partial support of our first hypothesis, self-efficacy, but not self-esteem, predicted academic adjustment and institutional attachment, but both predicted social adjustment and personal-emotional adjustment. Partially supporting hypothesis two, self-efficacy and perfectionist dissatisfaction predicted academic and personal-emotional adjustment, but only self-efficacy predicted institutional attachment. These results speak to the need for differential interventions for the four types of college adjustment. This research poster was presented at the Eastern Psychological Association annual convention in Boston in March 2014.

WAR AND TSUNAMI PTSD RESPONSES IN SRI LANKAN CHILDREN: PRIMACY OF REEXPERIENCING AND AROUSAL COMPARED TO AVOIDANCE-NUMBING

Champika K. Soysa, Ph.D.

This research addresses post-traumatic stress disorder symptoms in Sri Lankan children in response to war and the 2004 tsunami. Exposure to war and the tsunami each predicted the severity of post-traumatic symptomatology. In both studies, re-experiencing and arousal symptoms were reported more than avoidance-numbing. Furthermore, symptom severity was greater in groups reporting many symptoms compared to those reporting fewer symptoms, and there was no difference in symptom severity when the Diagnostic and Statistical Manual–IV set of six symptoms was compared to a different set of six symptoms (with just one avoidance-numbing symptom). The relative primacy of re-experiencing and arousal symptoms is highlighted in this understudied South Asian population, informing cultural variation in diagnostic criteria and clinical interventions for post-traumatic stress symptoms. An article about the results of these studies was published in 2013 in the *Journal of Aggression, Maltreatment, and Trauma*.

MINDFULNESS, SELF-COMPASSION, SELF-EFFICACY, AND GENDER AS PREDICTORS OF DEPRESSION, ANXIETY, STRESS AND WELL-BEING

Champika K. Soysa, Ph.D., Carolyn J. Wilcomb

We examined facets of mindfulness, dimensions of negative self-compassion, self-efficacy, and gender as predictors of depression, anxiety, stress, and well-being among 204 undergraduates in the United States. After accounting for self-efficacy, self-compassion, and gender, facets of mindfulness contributed a unique variance in predicting depression, anxiety, stress, and well-being. We confirmed the importance of mindful non-judging in predicting distress (inversely) and well-being, and identified the particular contributions of “mindful describing” for depression (inversely) and well-being. We established the value of “mindful non-reactivity” (inversely) for anxiety and stress. Additionally, we confirmed the relevance of self-judgment and isolation for depression and of isolation for stress. Finally, we established self-efficacy and gender as predictors of well-being. The preceding findings speak to the importance of investigating mindfulness, self-compassion, self-efficacy, and gender together in predicting depression, anxiety, stress, and well-being. An article about this research was published in the journal *Mindfulness*, first posting online in September 2013. The three publications will be displayed on the table in front of the posters.

SOCIAL CAPITAL, SELF-ESTEEM, POPULARITY, NEED FOR ACCESSIBILITY TO FRIENDS, AND STRESS PREDICT CYBER TECHNOLOGY USE

Champika K. Soysa, Ph.D., Jennifer M. Gardner

We examined social capital, self-esteem, popularity, need for accessibility to friends, and stress as gendered predictors of cyber technology use in 149 undergraduates. We investigated four kinds of cyber technology use: social networking, texting, Internet surfing, and MP3-player listening. Stress was the most consistent predictor of cyber technology use in men (social networking, texting, and MP3-player listening), while popularity was the most consistent for women (social networking, texting, and MP3-player listening). Furthermore, self-esteem inversely predicted use of internet surfing in men and MP3-player listening in women. The social capital dimension of “bridging online” predicted the use of both internet surfing and MP3-player listening in men and women. We extended the literature by establishing gendered social-cognitive dimensions of cyber technology use among undergraduates in the United States. An article on this research is scheduled to be published in the *International Journal of Cyber Behavior Psychology and Learning*. The three publications will be displayed on the table in front of the posters.

OLD MASTERS TO REMASTERED RENOVATIONS AT THE WORCESTER ART MUSEUM

Amy L. Cota-McKinley, Ph.D., Kathleen Martin

Summative evaluations were conducted in the Old Masters Gallery and the reinstallation titled “Remastered” at the Worcester Art Museum. The summative data was used to determine pre- and post-design changes to the gallery. The new design incorporates the installation of paintings hung medallion-style, which are mounted in clusters and tipped forward

into the space to facilitate connections between paintings. To encourage visitor interaction, traditional labeling was replaced with iPad technology, laminated gallery guides and books. Seating within the gallery was also reconfigured. Tracking maps and visitor interviews addressed the following questions: 1.) how visitors were utilizing the space, 2.) what was the level of engagement within the gallery and 3.) how visitors responded to the design changes in the Remastered gallery.

MINDFULNESS AND DECISION MAKING: THE EFFECTS OF EMOTION REGULATION WHEN FACED WITH RISK

Sandy DeCastro

Faculty Advisor: Vrinda Kalia, Ph.D.

Emotion regulation influences how individuals experience emotions (Richards & Gross, 2000). Research indicates that mindfulness is related to emotion regulation because it may enhance emotional differentiation (Hill & Updegraff, 2012). When one is unaware of emotions, decision-making may become more difficult, especially decisions about risk. Recent research has found that mindfulness may improve adaptive decision making (Lahey et al., 2007). The current study predicted that brief mindfulness training would affect risky decision-making. Risk-taking was assessed using the BART (BART; Lejues et al., 2002). Participants in the experimental condition were administered a 15-minute mindfulness training before being assessed on the BART. A one-way between subjects ANOVA conducted to compare the effect of mindfulness on risky decision-making in experimental (mindfulness) and control (no mindfulness) conditions found a significant effect of the mindfulness training $F(1,30) = 7.030, p = .01$. These findings suggest that being mindful can enhance clear and conscious decisions.

DEVELOPING APPLIED SKILLS WITHIN SOCIAL PSYCHOLOGY THROUGH THE USE OF GRADING RUBRICS

Amy Cota-McKinley, Ph.D.

The American Psychological Association published guidelines for the undergraduate psychology major that suggested goals and related student learning outcomes (SLO). One of those goals addresses application of psychological principles; a suggested SLO is the ability to “apply psychological concepts, theories, and research findings as these relate to everyday life.” Students enrolled in Social Psychology courses submitted an applied portfolio. The grading criteria instructed students to summarize the article, explain the social psychological concepts applied from the textbook, and connect the concepts to the article selected. Half of the participants were given an additional grading rubric and an example to assist them in the writing process. The rubric clearly delineated what constituted exceptional work from below-average work across four criteria: summary, explanation of concept, connection, and grammar. Analysis revealed that students who were given the grading rubric and example prior to writing had higher portfolio grades than students who did not have them.

SOCIOLOGY

BREAKING THE SILENCE BY NAMING PATRIARCHY AS A DATING PROBLEM: FEMINIST PRACTICES AS A GATEWAY TO EGALITARIANISM*

Nicholas Choquette

Faculty Advisor: Francisco Vivoni, Ph.D.

Patriarchy is a social system in which men control resources and ideals. It inherently entails female subordination through male power and privilege. From a feminist sociological perspective, I claim that patriarchy is a largely unexamined social problem evident in college dating. Gender inequality is evidenced in the epidemic of sexual violence and victim blaming on college campuses, a male-driven problem. Men often view women as a conquest and this is evident in the inequality of orgasms experienced in “hookups” and increasing rates of sexual assaults on campuses. Men and women who adopt egalitarian feminism can develop their true humanism through new and creative social roles. This paper will provide qualitative and theoretical insight from participant observations and from the research of Lorde (1984), Risman (2010) and Friedan (1963) into real world social practices for reducing patriarchy and promoting equality in college dating.

HURRICANE SANDY AND THE URGENCY OF ECOLOGICAL DISASTER: A SOCIOLOGICAL ANALYSIS OF ECOLOGICAL CRISES AND ALTERNATIVE PRACTICES FOR THE COMING ERA

Alexander Rezk

Faculty Advisor: Francisco Vivoni, Ph.D.

The time approaches when urgent ecological crises will force specialists from an ever-broadening pool of disciplines to consider human activity in relation to the environment. This ecological urgency results from the devastation wrought upon the planet after over a century of industrialization and capitalist expansion. This subject became of prime importance to me following the damage to my home and community in Coney Island, N.Y., during Hurricane Sandy in 2012. Through the scholarly analysis of writers such as Karl Marx, Audre Lorde, and Ulrich Beck, as well as personal experience, this presentation will discuss how sociologists can help navigate a world on the precipice of environmental catastrophe by envisioning a new wave of social theory. To do so, institutions of capitalism, consumerism, and industrialization must be held accountable for anthropogenic ecological changes, and social systems not controlled by the interests of profiteers and financial entities must be devised.

SOCIOLOGY AND EDUCATION: A RECIPE TO CHANGE THE WORLD

Nicole Brogan

Faculty Advisor: Fortunata Songora Makene, Ph.D.

As human beings, many of us naturally make negative observations and take what we have for granted. We turn on the news and watch reports of world issues, murders, motor vehicle accidents, and devastating weather reports. Society has many downfalls; sociologists want to uplift and bring positive change to the world around us. Completing an independent study at Woodland Academy gave me opportunities that regular classes did not. My own white privilege and life chances versus the experiences of students at Woodland Academy, who were mostly ethnic minorities, have given me different experiences than these children. By getting to know students firsthand and reflecting on what I experienced in connection with what I learned in my courses, I have a well-rounded view and a list of new goals and ambitions to change the world, to view society from a different perspective, and to develop many new directions to bring positive change to the world around me. Empowering students and giving them skills to enable them to succeed in their academic careers should be the goal of future teachers, especially in a school like Woodland Academy.

THE IMPACT OF PARENTAL SOCIALIZATION ON COLLEGE STUDENTS' EDUCATIONAL EXPERIENCES

Julia Squiers

Faculty Advisor: Sonya Conner, Ph.D.

A Commonwealth Honors Project

As the number of first-generation college students entering college grows, it is essential to gain a better understanding of the role families and schools have played in shaping their educational trajectories. Annette Lareau (2011) found that parents' class-based childrearing strategies accounted for differential educational trajectories during their children's transition to adulthood. This study investigates the role of differential parental socialization on college students' experiences. The primary hypothesis of this study is that individuals who were exposed to what Lareau describes as "concerted cultivation" have developed skills and knowledge that impact their college experience in beneficial ways, compared to students whose parents used what Lareau terms a "natural growth" childrearing strategy.

SOCIAL CONSTRUCTION OF CHILDHOOD AND LIFE CHANCES FOR CHILDREN IN TANZANIA**

Rebekah Lizotte

Faculty Advisors: Fortunata Makene, Ph.D., Sonya Conner, Ph.D.

This study focuses on the social construction of childhood in relation to Max Weber's "life chances" concept. Life chances, according to Max Weber, are the extent to which individuals have access to important societal resources, such as food, clothing, shelter, education, and health care. Though we are in no way in control over where we are born, our success in life

is related to the resources to which we have access. Children in Tanzania are directly affected by poverty, global exploitation of natural resources, lack of medical resources, and poor educational systems, which affects their life chances. I used visual ethnographic methods, and will present my findings in the form of a video slideshow, to illustrate the essence of childhood in Tanzania. My findings reveal that while their lives did not mimic my experience of privilege as a U.S.-born child, there were many benefits of being surrounded by a culture not perpetuated by consumerism and individualism. Nevertheless, the findings suggest that global systems perpetuate inequality for specific groups of people.

TANZANIA VS. THE UNITED STATES: CULTURE, CORPORATIONS, AND THE EFFECTS ON HEALTH

Cassie Giardina

Faculty Advisor: Fortunata Makene, Ph.D., and Sonya Conner, Ph.D.

Tanzania and the United States each have a different set of cultural norms. Each nation's laws, access to resources, history, and people in power have an effect on cultural norms. Utilizing a sociological perspective, I observed different cultural values in each country and how the people adopt these values. I analyzed these different cultural norms and how they affect the physical, mental, and emotional health of the population. I found that each country's cultural standards and values influence different aspects of health in their society in contrary ways.

URBAN STUDIES

DIGNIFY AFRICA MOVEMENT: REDEFINING AFRICA

Shiko Gathuo, Ph.D.

Ask most people what they know about Africa, and they will narrate an inevitable litany of ills: ethnic conflicts and civil wars; famine and widespread starvation; HIV/AIDS, malaria and other diseases; savagery and exotic traditions; despair and hopelessness. Africa is not only the butt of jokes; people are apt to make stereotypical statements about the continent without giving thought to either the truthfulness or the consequences of their statements. True, Africa has many problems, and many of its people live in poverty. There is, however, always more than one side to any story. For Africa, only one side has emerged. The mission of Dignify Africa Movement is to dignify Africa and its people by changing the existing narrative about the continent. We do this in two ways with this poster presentation: 1) we showcase Africa by highlighting the untold everyday stories and positive developments, and 2) we fight the negative stereotypes, falsehoods and misrepresentations perpetrated against the continent.

HEAD START: A NECESSARY INVESTMENT FOR THE FUTURE

Kaleigh McManus

Faculty Advisor: Thomas Conroy, Ph.D.

As the pressure to reduce the national debt remains the driving force behind budget cuts in the national budget, Head Start is a program affected deeper than other organizations. Head Start runs on a budget that is inadequate for the amount of resources that the program needs. During the 2013 sequester, Head Start programs across the country closed their doors, reduced the number of children served, and laid off teachers and staff. This not only hurt the students, but their parents and society as a whole. If every child who lived in poverty had access to a Head Start program, the economy as a whole would be stronger, and the government could avoid the cost of future services that would not be so greatly relied upon as a result of the availability of Head Start. These services can include after-school programs, tutoring for students, social services or even incarceration later in life. This research paper and poster presentation will prove that cutting funding for Head Start programs results in financial repercussions for state and national governments.

WSU STUDENTS IN THE COMMUNITY: THE ENGLISH LANGUAGE LEARNERS PROGRAM

Samuel Demma, Jean Abdulla, Dannielle Morrow, Tom Savini
Faculty Advisor: Madeline Otis Campbell, Ph.D.

The English Language Learners program, sponsored by the Intergenerational Urban Institute and the department of Urban Studies, facilitates relationships among WSU students and English language learners of all ages from the community. This for-credit practicum is an experiential learning course, which provides students with the opportunity to teach conversational English, assist community members preparing for citizenship, and form community based relationships. In the process, an intercultural exchange happens as tutors and learners share their stories and perspectives. Recently the program has expanded beyond the WSU classroom to three off-site locations in the Worcester community: an elder Worcester Housing Authority site, the Worcester Senior Center, and the Nu Cafe. WSU students tutor Iraqi, Lebanese, Albanian, Russian, Chinese, and Colombian learners, filling a need in the community and receiving a uniquely personal, global perspective. This poster will highlight the work of the ELL program, identifying the student as well as community outcomes achieved.

SUSPENSION IN WORCESTER: A CONTINUING CONVERSATION

Dannielle Morrow, Jenny Velez
Faculty Advisor Thomas Conroy, Ph.D., Madeline Otis Campbell, Ph.D.

During spring 2013, the Latino Education Institute at Worcester State University and the Worcester Education Collaborative analyzed demographic and suspension data related to the Worcester Public Schools system. This data came from federal, state, and local sources, particularly from the Office of Civil Rights, the Massachusetts Department of Elementary and Secondary Education, and the Worcester Public Schools data warehouse.

RISING FOOD INSECURITY IN WORCESTER COUNTY

Barbara Lucci, Thea Aschkenase, Marta Baclawska, Amy Boucher, Mary Chenaille, Rachel Geary, Judy Knight, Mary Ellen Macuen, LissaAnn Minichiello, Jenifer Seifart
Faculty Advisor: Maureen Power, Ph.D.

This poster presentation will demonstrate the ways the Hunger Outreach Team (HOT) located in Urban Studies continues to fight hunger in the Worcester community. The Supplemental Nutrition Assistance Program (SNAP), formerly known as food stamps, is a federal program that helps put food on the table. HOT is an intergenerational advocacy group of students, ages 20 to 90, that assists elders in the community and students on campus in applying for SNAP benefits. The team uses a SNAP Bingo game to educate elders at senior centers. Only one-third of eligible elders apply for SNAP, and many Worcester State University students are unaware they are eligible. Every \$5 in SNAP benefits stimulates \$9 in the local economy. Congress reduced SNAP benefits by nearly 40 billion, making it even more important for those eligible to receive the benefits. HOT members advocate for legislative reform in hunger disparities. The annual Empty Bowl event on campus raises funds for local assistance.

ADDRESSING BLIGHT: A COMPREHENSIVE RE-USE PROPOSAL FOR LINCOLN SQUARE

Desiree Cunningham, Michael Falzarano
Faculty Advisor: Thomas Conroy, Ph.D.

Through a combination of research objectives, this project aims to reveal possible methods that community members and the city of Worcester can employ to actively participate in determining the future of Lincoln Square. By addressing blight with architectural solutions, geography-based data and a myriad of strategic planning initiatives, Worcester's historically endangered Lincoln Square could again become an integral part of the city's urban landscape.

GROWING RELATIONSHIPS, COMMUNITY AND PRODUCE AT THE WSU GARDEN FOR ALL AGES

George Ayanga, Rachel Geary, Breana Hatch, Jack Kelly, Tyler Levine, Brogan Mulligan, Jenifer Seifart, Linda Barrett, Mary Chenaille, Eileen Rodgers, Pam Saffer, Dorothea Simmons
Faculty Advisor: Maureen Power, Ph.D.

Now in its third growing season, the Garden for ALL Ages adjacent to Chandler Magnet School has transformed what once was a neighborhood eyesore into a rich and beautiful outdoor learning environment. Not only vegetables, but flowers and herbs grow in this garden; relationships do as well. This poster presentation will show how residents of neighboring Bet Shalom, eight Chandler Magnet classes (two of which are special needs), and the Worcester State University garden team are working together to expand the garden and the growing season. To offset the cold winter, portable greenhouses (with support from Theme Semester) have been erected in the Bet Shalom community room and the Chandler Magnet classrooms. Plans for higher raised beds and special pathways will make it wheelchair accessible. Bird houses, a butterfly garden, and medicinal native plants and herbs will make it a great community resource and rich learning environment for all ages.

CHOLERA IN WORCESTER: A STUDY OF THE NINETEENTH-CENTURY PUBLIC HEALTH MOVEMENT**

Alan Ira Gordon, Instructor

This study was published in the winter of 2014 issue of the *Historical Journal of Massachusetts* and compares the municipal, medical and social responses in Worcester to the 1849 and 1866 national cholera outbreaks. While public attitudes towards both epidemics demonstrated the misguided idea that cholera was a disease of immoral intemperance, the medical and municipal responses to the later epidemic reveal a shift from finding a cure to preventing the disease. When confronting the later epidemic, Worcester's municipal leaders mobilized resources to promote sanitation. Worcester's response to these two epidemics offers a case study of the important role that cholera played in the rise of the public health movement in America.

VISUAL AND PERFORMING ARTS

COMPOSITIONS BY WSU STUDENTS

Fall 2013 Composition Class
Faculty Advisor: Kyle Martin

Recordings of musical works written by student composers, both VPA majors and non-majors, will be presented.

SPRING BREAK LEADERSHIP TRIP TO WASHINGTON, D.C.

WASHINGTON, D.C.

Shannen Curtin
Faculty Advisors: Carl Herrin and Patrick Hare

Thanks to the generosity of the Honors Program, I spent my spring vacation in Washington, D.C. This trip took 18 Worcester State University students to sightsee in the nation's capital as well as to meet with a variety of national and Massachusetts Congressional representatives. We led discussion on topics such as awarded Pell Grants and federal aid for Worcester State students. The experience gave us the rare chance to express what we need as students to be successful in college. This trip was the educational experience of a lifetime.

HONORS STUDENTS REFLECT ON THE WASHINGTON, D.C., EXPERIENCE**

Gwendolyn Bois, Tony Caushi, Debora Dias
Faculty Advisors: Carl Herrin and Patrick Hare

During our panel, we plan to discuss the expectations we had before going to Washington, D.C., in comparison to our actual experiences. We would also like to describe specific examples of our hands-on political experiences and how they amplified the knowledge we'd earned in classes about politics at WSU. We'd like explore how being in D.C. and studying politics has enriched our understanding of the national and state political spheres. Most importantly, we'd like to discuss the impact these understandings have had and will continue to have on us as citizens in an ever-changing society—and how with these tools, we plan to change the way world works for the better.

ADVOCACY IN THE CAPITAL**

Brandy Klaes and Brian Mullen

Faculty Advisors: Carl Herrin and Patrick Hare

Last month, we attended the WSU Spring Break Leadership Trip to Washington, D.C., with financial support from the Honors Program. We met with congressional legislators and advocated for state school funding, Pell Grants, and the needs of international students. We also had the chance to tour parts of our nation's capital and study our nation's history. This panel will reflect on how this experiential learning has augmented our studies at Worcester State and what we learned from interacting with our elected officials.



**Celebration of Scholarship and Creativity
Planning Committee**

Kimberly Brothers-Caisse

Melissa Fleming

Shauna Gendron

Golda Guella

William Hansen, Ph.D.

Linda Larrivee, Ph.D.

Mark LaCroix

Patricia Marshall, Ph.D.

Lisa McCormack

Heather Treseler, Ph.D.



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