
Niagara University
Undergraduate Research Conference



Friday, May 3, 2019

St. Vincent's Hall and Russell J. Salvatore Dining Commons

AGENDA

Hospitality Room for Participants and Faculty Sponsors

(Coffee and Donuts)

8:30 AM – 12:00 PM

St. Vincent's Hall, Room 310

Panel Presentations

9:05 AM – 1:15 PM

St. Vincent's Hall

(Schedule Follows)

Lunch for Participants and Faculty Sponsors

11:30 AM – 3:00 PM

Russell J. Salvatore Dining Commons at Clet Hall

(Participants will receive a lunch voucher upon check in at Russell J. Salvatore Dining Commons)

Poster Presentations

1:00 PM – 3:00 PM

Russell J. Salvatore Dining Commons

I want to extend a warm welcome to the 2019 NU Undergraduate Research Conference sponsored by the University Honors Program. Niagara University's dedication to research and academic excellence will be on full display during today's conference. I encourage you to attend as many of the panel and poster presentations as you can in order to show your support for the young scholars in our midst and to learn about the exciting research taking place here at Niagara. I am confident that the presentations will be informative and educational.

I want to thank Mrs. Jennifer Ebbole, Administrative Coordinator for the Honors Program, who has done most of the behind-the-scenes work necessary to make this conference a reality. Without her, there would be no conference. Finally, I want to thank all the participants and their sponsors for their hard work. The University Honors Program wishes them all the best in their future research and endeavors.

Dr. Michael Barnwell

Director, University Honors Program

PANEL PRESENTATIONS

9:05 AM – 1:15 PM

ST. VINCENT'S HALL 206

9:05 AM

English: Dr. Daniel Pinti

Mallory Ronan

"Young Adult Exile and the Reconstruction of Community in Alexandra Bracken's The Darkest Minds"

Julia Arena

"(Re)Forming Relationships: Dismantling Binaries and Hierarchies in Asterios Polyp"

Tyler Bingham

"Rejecting the Color Line: Using Subcultural Theory to Grant Wei-Chen the Power of Racial Resistance in Gene Luen Yang's American Born Chinese"

Sara E. Anderson

"Cuz I'm Spider-Man. And I'm Not the Only One": The Web of Personal Identities and Personal Relationships in Spider-Man: Into the Spider-Verse"

10:10 AM

English: Dr. Jamie Carr

Arianna Gabriel

"The Restriction of Civil Liberties in The Handmaid's Tale and Québec"

Tyler Bingham

"False Dilemmas: Undercutting Gender Binaries through Three Guineas and The Handmaid's Tale"

11:15 AM

Finance: Edward Hutton, Dr. Ann Rensel, Dr. Petter Lovaas

Emma Lindke

"Operational Risk in the Financial Services Industry"

12:20 PM

Marketing: Dr. Paul Richardson Dr. Peggy Choong Dr. Carrie Teresa

Zackary Kephart

"Breaking The Bond Between Country Music And The Radio"

9:05 AM – 10:00 AM

ST. VINCENT'S HALL 207

9:05 AM

Actuarial Science: Dr. Chad Mangum

Elizabeth Faxlanger

"Planning for Retirement: The Doors Financial Literacy Can Open"

9:05 AM – 1:15 PM

ST. VINCENT'S HALL 301

9:05 AM

Biology - Biotechnology: Dr. Cassandra Marnocha, Dr. William Edwards

Joy O'Brien

"The unsuspected competition between green and purple sulfur bacteria in Fayetteville Green Lake"

11:15 AM

Psychology: Dr. Milen Radell

Brian McGuire

"The Ethanol Seeking Behavior of Behaviorally Inhibited Goldfish"

12:20

Criminology & CJ: Dr. Talia Harmon

Richelle Kloch

"A REVIEW OF BAZE V. REES, AND ALL LETHAL INJECTIONS IN TEXAS SINCE 1982"

9:05 AM – 11:15 AM ST. VINCENT'S HALL 306

9:05 AM

Biochemistry: Dr. Mary McCourt, Dr. Lawrence Mielnicki

Thao Huynh

"Encapsulation and Delivery of Trastuzumab into human breast cancer cells using Cholestosome™"

10:10 AM

Philosophy: Dr. Alexander Bertland

Jacob Foote

"Cold Hearts or Heated Spirits: Hegel, Marx, and Human Freedom"

9:05 AM – 10:00 AM ST. VINCENT'S HALL 309

9:05 AM

Environmental Science: Dr. William Edwards Dr. Cassandra Marnocha

Kaleigh Block

"A device for high resolution sampling within the monimolimnion of a meromictic lake"

9:05 AM – 10:00 AM ST. VINCENT'S HALL 315

9:05 AM

Religious Studies: Dr. Robert St. Hilaire

Mikayla Fulton

"Tolkien's 'Leaf by Niggle': A Christian Reflection on the Eternal Value of Work"

9:05 AM – 1:15 PM

ST. VINCENT'S HALL 307

9:05 AM - 11:15 AM

Russian History: Dr. Mustafa Gokcek

Alexander Bush

“The Challenge of Censorship to the Russian Intelligentsia between 1750 and 1850”

Hunter FitzGerald

“The Winter War and Its Implications for the Russian Military”

Joseph Malek

“Through Differences: Russian Intellectuals in the 18th and 19th Centuries”

Middle Eastern History: Dr. Mustafa Gokcek

Brandon Labend

“Secularism in Modern Turkey”

Ryan Dutschman

“Erdogan's Authoritarianism in Art”

Matthew Thompson

“The Evolution of Arab Nationalism”

11:15 AM

Art History and Museum Studies / Women's Studies: Marian Granfield

Olivia Takacs

“The Modern and Contemporary Pieta: Authentic Females' Perspectives of Motherhood”

12:20

History: Dr. Shannon Risk, Dr. Michael Durfee, Dr. Hope Russell

Marissa Seib

“The Asylum Era: An Examination of the U.S. Mental Health Care System during the Progressive Era”

POSTER PRESENTATIONS

Biochemistry: Dr. Christopher Stoj

Olga Donchu, John Pinti

“Cloning of a yeast multicopper oxidase domain for enzyme characterization and mutagenesis”

Biochemistry: Dr. Virginia Glazier

Kristen Donovan

“EFFECTS OF CARBON DIOXIDE ON FLUCONAZOLE SUSCEPTIBILITY IN CRYPTOCOCCUS NEOFORMANS”

Biochemistry: Dr. Christopher Stoj

Elaine Militello

“Catalytic oxidation of iron by Multicopper oxidases”

Biochemistry: Dr. Robyn E. Goacher

Olivia Schroeder, Claire Schoemick

“Pesticides on Produce”

Biology: Dr. Mark Gallo

Janelle Fancher, Shania van Nuland, Maria Kajdasz

“ISOLATION OF BACTERIOPHAGE IN STAPHYLOCOCCUS SPECIES”

Biology: Dr. Mark Gallo

Dayron Leyva

“Isolation of Glycoside Hydrolases Towards Goal of Universal Blood”

Biology: Dr. Mark Gallo

Jessica Nguyen, John Klem

“RATE OF pGLO LOSS WHEN SELECTIVE PRESSURE IS REMOVED”

Biology: Dr. Mark Gallo

Rachisan Djiake, Tihagam Linh Vuong

“METHICILLIN RESISTANCE IN STAPHYLOCOCCUS ASSOCIATED WITH WHITE TAIL DEER”

Biology: Dr. Brandon Sansom

Dominic Salvatore, Matthew Vogt, Gregory Schuey

“Effects of Urbanization on Overall Water Quality of Gill Creek”

Biology: Dr. Robert Greene

Logan Slother, Anthony Di Cecca

“Actinomycin D Effects on HeLa Cervical Cancer Cells”

Biology: Dr. Robert Greene

Amanda Ventrella, Audrey Dunn

“Vitamin D Effects on MCF-7 Cells”

Biology: Dr. Brandon Sansom

Rebecca Dobrasz, Mikia Lewis

“Temperature Change and Aquatic Plant Growth”

Biology & Life Sciences: Dr. Brandon Sansom

Ashley Eisenhauer, Carly Kleitz

“Trees of Niagara”

Botany: Dr. Brandon Sansom

Joy O'Brien, Elizabeth Kelsey-Gossard, Noah Kaczmarek, Emily O'Brien

“The Distribution of Select Invasive Species in De Veaux Woods State Park and the Niagara Falls Gorge”

Chemistry: Dr. Robyn Goacher

Zachary Augustyn

“Metal Analysis of Fresh Water Bodies of Western New York by Atomic Absorption Spectroscopy”

Chemistry BA: Dr. Robyn E. Goacher

Brianna Kehoe

“Applications of Spectroscopy for the Identification of Counterfeit Currency”

Chemistry BS: Dr. Robyn E. Goacher

Reilley Larkin

““Bones” Forensic Report-card”

Chemistry BS: Dr. Robyn Goacher

Jenna Schlosser

“A proposal to study common chemicals found in cosmetics and how they transform in the environment”

Chemistry BS: Dr. Robyn Goacher

Elaina Spendio, Joshua Pitruzzella

“Drinking Water Quality”

Chemistry BS: Dr. Luis Sanchez

Emily Steiner

“STUDIES TOWARD THE SYNTHESIS OF ENT-ARTEMISININ, A POTENTIAL ANTIMALARIAL COMPOUND”

Chemistry BS: Dr. Robyn Goacher

Emily Steiner, Gregory Ernst

“Using 2D NMR for Advanced Molecular Characterization”

Computer & Information Science: Glenn Papp

Caleb Goldfus

“Cyber Warfare: Government-Funded Private Operations”

Computer & Information Science: Dr. Yonghong Tong

Bryce Molnar, Alex Farkus, Cynthia Hunt, Blair Swanick

“Internet of Things and Smart Campus”

Computer & Information Science: Dr. Yonghong Tong

John Stoddard

“Providing Accessibility through the Design and Development of Mobile Applications”

Criminology & CJ: Dr. Dana Radatz

Kaitlyn Walek

“Awareness and Perceptions of Domestic Violence”

Education B-6 Early Child & Child Education: Dr. Mary Ellen Bardsley

Marie Gruszczynski

“A comparative study of 10-year-old girls' experiences of educational systems in Germany, South Korea, Finland, Ghana and India”

Education B-6 Early Child & Child Education: Dr. Mary Ellen Bardsley

Kalie Sonnenberg

“Maslow's Hierarchy of Needs for English Language Learners”

Education 1-6 Child & Special Education: Dr. Robin Erwin

Megan Ciotuszynski

“Recess and it's Benefits: Teacher's Perspectives- From Theory to Practice”

Education 1-9 Math: Dr. Maritza Branker, Dr. Amanda Mangum, Dr. Paul Vermette

Kathryn Liotta

“Women in Mathematics”

Education 7-12 Math: Dr. Maritza Branker, Dr. Dennis Garland

Jacquelyn Maass

“Gamifying Math Instruction”

Environmental Science: Dr. Brandon Sansom

Hannah Frasier, Danielle Goggin

“How Aquaponics Affects Plant Growth”

Environmental Science: Dr. Brandon Sansom

Hannah McCrady, Kori Kammerdeiner, Taylor Donoughe

“Herbalism: A Focus on Turmeric and St. John's Wort”

Environmental Science: Dr. Brandon Sansom

Charles Roth, Jose Gomez

“Invasive species diversity between old Niagara campus and present Niagara campus”

Gerontology: Dr. Susan Mason

Amber Catani

“Age Adult Differences in Counseling: Issues and Views”

Gerontology: Dr. Mark Gallo

Sophia Smith

“Knowledge and Attitudes of College Aged Individuals in regard to the Human Papillomavirus Vaccine”

Gerontology: Dr. Susan Mason

Sophia Smith

“Age Differences in Knowledge and Views about Cancer”

History: Dr. Michael Durfee

Samantha Kaczor

“Power in Refuge: The Urban Black Church from the Great Migration to Civil Rights, 1890-1950”

International Studies: Dr. David Reilly

Arianna Drissi

“Female Genital Mutilation/Cutting”

International Studies: Dr. David Reilly

Meghan Johnson

“The Effect of Freedom on Human Rights Violations”

International Studies: Dr. David Reilly

Dylan Kubala

“Income Inequality and Protest Activity”

International Studies: Dr. David Reilly

Colin Leith

“International Land Trading and Sovereignty”

International Studies: Dr. David Reilly

Benjamin Schian

“Relationship between State Repression and Resistance”

International Studies: Dr. David Reilly

Lukas Wenninger

“Trust in the EU”

Mathematics: Dr. Joel Louwsma

Zachary Harris

“Arithmetical Structures on Complete Graphs”

Nursing: Dr. Jennifer Scarpna, Dr. Malena Jones, Carol Winkler, Dr. Timothy Osberg

Kaitlin Sawyer

“Nursing Students' Awareness of Human Trafficking”

Nursing: Dr. Malena Jones, Dr. Mary Kozub, Carol Winkler

Alexandra Simons

“The Impact of Horizontal Violence on Student Nurses' Learning”

Political Science: Dr. Christopher Lee

Oliver Ashe

“Support for the IRA in Northern Ireland”

Political Science: Dr. David Reilly

Tiernan Callaghan-Mccann

“The Benefit of Presidential Travel”

Political Science: Dr. Christopher Lee

Angelo R. Catalano

“The Economic Transformation of China”

Political Science: Dr. Christopher Lee

Chris Darner

“Militia Groups in Africa”

Political Science: Dr. David Reilly

Ethan De Rosa

“Decentralization in Italy and China”

Political Science: Dr. Christopher Lee

Gabriella Decker

“The effect of poverty on recidivism.”

Political Science: Jamie Pimlott

Cheyenne Freely

“The Crime of Mental Illness: A Comprehensive Study of the American Response to Deinstitutionalization”

Political Science: Dr. David Reilly

Joel Gonzalez

“Effects of Income on Education In The U.S.”

Political Science: Dr. David Reilly

Jason Hake

“Analysis of Airstrikes by Armed Drones and Manned Aircraft on Civilian Populations”

Political Science: Dr. David Reilly

Jordan Hartman

“The Relationship Between Religious Affiliation and Opinion on The Use of Torture of Suspected Terrorists”

Political Science: Dr. Christopher Lee

Izabella Keetch

“Abortion Restrictions”

Political Science: Dr. David Reilly

Alexandria LaMantia

“Opinions on Crime Prevention”

Political Science: Dr. Christopher Lee

Emma Mercurio

“The Effects of Gentrification on Gangs”

Political Science: Dr. Christopher Lee

Raven Nelson

“Drugs and Poverty”

Political Science: Dr. David Reilly, Dr. Christopher Lee, Dr. John Stranges

Kyle Nielsen

“The "Rise" of China and the future of the International order”

Political Science: Dr. Jamie Pimlott

Sadie Newcombe

“Speech Patterns in the U.S Senate”

Political Science: Dr. Christopher Lee

William Nowak

“State repression and voter turnout”

Political Science: Dr. David Reilly

Morgan Palmer

“Mandatory Minimums”

Political Science: Dr. David Reilly

Vongsavanh Phengsomphane

“Oil's Impact on Country's Regimes Types”

Political Science: Dr. Christopher Lee

Elijah Restuccio

“The effects of climate change on coastal communities”

Political Science: Dr. Christopher Lee

Francesca Reyes

“People of Color and Rate of Incarceration.”

Political Science: Dr. Christopher Lee

Kevin Rinaldi

“War on drugs”

Political Science: Dr. Christopher Lee

Michela I. Rossetti

“A Woman's Place Is Saving the World”

Political Science: Dr. David Reilly

Ipek Saracoglu

“Protest and Repression”

Political Science: Dr. Christopher Lee

Cole Sebastianelli

“First Ladies and National Health Programs”

Political Science: Dr. Christopher Lee

Olivia Showers

“The Impact of Government Surveillance”

Political Science: Dr. Christopher Lee

Nicholas Stoll

“Human Rights in China”

Political Science: Dr. Christopher Lee

ShaTeek Trantham

“Violence in the environmental movement”

Political Science: Dr. Christopher Lee

Kylie Tucci

“Sharks and the environment”

Political Science: Dr. David Reilly

Elifruveida Uisal

“Public Opinion on illegal immigration to U.S”

Political Science: Dr. Pimlott

Emily Wilbur

“State Supreme Court Elections”

Psychology: Dr. Burt Thompson

Rebecca Collins, Mara Scive

“Gender Differences in Facial Recall”

Psychology: Dr. Susan E. Mason

Jamie Hagerty, Kayla Kolacz

“Adult Age Differences in Attitudes about Organ Donation”

Psychology: Dr. Timothy Osberg

Lauren Hearn

“College Alcohol Beliefs and Drinking Consequences: A Conditional Process Analysis”

Psychology: Dr. Susan E. Mason

Kayla Kolacz, Jamie Hagerty

“Adult Age Differences in Attitudes about Chiropractic Care”

Psychology: Dr. Donna Thompson, Dr. Milen L. Radell

Brian McGuire, Alexis Schafer

“Visual Acuity in Goldfish (*Carassius auratus*)”

Psychology: Dr. Milen Radell, Dr. Donna Thompson

Brian McGuire

“First Trial Predicts Overall Performance in Goldfish Visual Discrimination Regardless of Training Difficulty”

Psychology: Dr. Timothy Osberg

Anna Mundy, Jaclyn Foulis

“Predicting Freshman Drinking Consequences: A Study of Student and Parent Alcohol Beliefs”

Psychology: Dr. Milen Radell

Sara Vogel

“Personality and Residence Hall Satisfaction”

Public Health: Dr. Deborah A. Leonard

Samone Carr, Kiara Santiago, MacKenna Bluett

“Where the Youth Are in Charge”

Public Health: Dr. Deborah A. Leonard

Karsen Cotton, Aubrey DeVeau, Emily Johnston

“A Proposed Intervention to Decrease Obesity in Niagara Falls”

Public Health: Dr. Deborah A. Leonard

Elizabeth DiCarlo, Emily Westfall, Matthew Vogt

“A Proposed Intervention to Decrease Litter and Create Job Opportunities in the Niagara Falls Community”

Public Health: Dr. Deborah A. Leonard

Zoe Gavin, Meghan Lippa, Nina Dilella

“Improving Home Environments within Niagara Falls”

Public Health: Dr. Deborah A. Leonard

Caroline Leitch, Cameron Maris, Hailey Bicknell

“Intervention for Increasing the use of Public Transportation In Niagara Falls”

Public Health: Dr. Mark Gallo

Riley Meechan

“Implementation of the Backpack Program in Summer Camps to Combat Food Insecurity: A Pilot Project”

Public Health: Dr. Mark Gallo

Cassidy Okon

“Invasive Plant Removal and Native Plant Conservation at Niagara University”

Public Health: Dr. Deborah A. Leonard

Charles Richards, Nicholas Robel, Megan Cunningham

“Combating Gum Disease and Improving Dental Hygiene in Niagara Falls”

Public Health: Dr. Mark Gallo

Margaret Smith

“Narcan/Naloxone”

Science: Dr. Christopher Stoj

Brendan DeCoff

“Niagara University Science Undergraduate Research Fellowship Program”

Social Work: Dr. Rolanda Ward

Cierra Axton, Jamie Guadagno

“Adolescent Mental Health”

Social Work: Dr. Rolanda Ward

Kaylyn Townsend

“Youth Educational Advocacy: Perceptions of Race and Equality Issues in Schools”

UGRC ABSTRACTS

College of Arts & Sciences

Actuarial Science
Art History and Museum Studies
Biochemistry
Biology
Biology - Life Sciences
Biotechnology
Botany
Chemistry
Computer and Information Sciences
Criminology/Criminal Justice
English
Environmental Science
Gerontology
History
International Studies
Mathematics
Nursing
Philosophy
Political Science
Political Science
Psychology
Public Health
Religious Studies
Social Work

College of Business Administration

Finance
Marketing

College of Education

Early Child & Child Education B-6
Child & Special Education 1-6
Math Education 1-9
Math Education 7-12

COLLEGE OF Arts & Sciences

Actuarial Science

Planning for Retirement: The Doors Financial Literacy Can Open

Elizabeth Faxlanger

Sponsoring Professor

Dr. Chad Mangum

This paper examines the importance of retirement savings and financial literacy. Using Microsoft® Excel's® net present value and future value functions, the value of a person's retirement account at age 28 and age 63 were computed on the basis of three key variables. The @Risk™ Excel add-in allowed for a range of possible retirement account values to be calculated, better showing the impact of variations in the average age a person starts saving for retirement and the average rate of return. Based on a fixed average retirement age and a fixed life expectancy, the amount that a person can withdraw from his or her retirement account each year was computed using Excel's payment function and then taxed at the average historic effective tax rate. This ultimately gave a net withdrawal amount that is more representative of the funds a person would have available during retirement. Based on the results, it is recommended that financial literacy is incorporated into education, preferably in middle school. The later a person starts saving and the less aggressive a person invests his or her savings, the less he or she will have available during retirement. As such, if children are exposed to the importance of saving at a young age and being financially literate, they will better understand why it is important to put money away for retirement.

COLLEGE OF Arts & Sciences

Art History and Museum Studies

The Modern and Contemporary Pieta: Authentic Females' Perspectives of Motherhood

Olivia Takacs

Sponsoring Professor

Marian Granfield

Over the past several decades, there has been a slow progression toward the recognition and celebration of women artists. Although we discuss, exhibit, and write about more contemporary women artists today, the disparity between the inclusion and representation of these artists compared to their male counterparts is still troubling. If women's contributions in the field of art history are not discussed at the same level as their male counterparts, then the spectrum of knowledge and understanding is limited.

This paper examines, through comparison, a selected group of female artists to raise awareness about their unique contribution as women to the dialogue. In this paper I analyze different interpretations, perspectives, and representations of one of the most revered Renaissance art work; Michelangelo's La Pieta, by five women artists: Sarah Bernhardt, Gay Riseborough, Kathe Kollwitz, Hannah Hoch, and Dorothea Lange. The subject of Mary mourning the death of her son Jesus has been a popular subject inspiring many artists to create their own versions. While I discovered a number of women artists who have addressed this topic, the five modern and contemporary women artists that I have chosen brings a personal and unique interpretation to the subject of a woman's despair. The goal of this paper is to not only present the talents and contribution of these five individual women artists and their artworks, but to also continue the discussion of raising awareness to the many talented women artists deserving of our attention and those yet to be discovered.

COLLEGE OF Arts & Sciences

Biochemistry

Cloning of a yeast multicopper oxidase domain for enzyme characterization and mutagenesis

Olga Donchu

John Pinti

Sponsoring Professor

Dr. Christopher Stoj

The Stoj Laboratory is focused on understanding the complex mechanisms by which biological systems acquire and utilize metal ions for a variety of cellular processes. Several metal ions, such as iron and copper, are essential biological cofactors and yet over accumulation, or the cellular mismanagement of metal ion stores, can lead to toxicity and pathologies including, hemochromatosis (iron overload) and Alzheimer's Disease (where copper and zinc have been shown to bind to amyloid beta proteins), for example. Cellular and organismal damage associated with iron and copper is thought to be associated with the pro-oxidant nature of the lower valent states, Fe^{2+} and Cu^{+} respectively, as they react with oxygen to produce reactive oxygen species (ROS), including hydrogen peroxide and superoxide, that damage cellular components including DNA, proteins, and membrane lipids. A key player in iron and copper metabolism is a class of enzymes called multicopper oxidases (MCOs). These enzymes catalyze the oxidation of Fe^{2+} (and Cu^{+}) to Fe^{3+} (and Cu^{2+}) producing water from molecular oxygen, while managing the propensity of lower valent iron and copper to participate in ROS formation. This project aims to create a cloning vector containing a MCO catalytic domain for subsequent mutagenesis and characterization. Specifically, we intend to clone a MCO catalytic domain from the Baker's Yeast, *Saccharomyces cerevisiae*, into a commercially available host cloning vector pQE-16 from Qiagen.

COLLEGE OF Arts & Sciences

Biochemistry

Catalytic oxidation of iron by Multicopper oxidases

Elaine Militello

Sponsoring Professor

Dr. Christopher Stoj

Iron is an essential micronutrient for animals, plants, and microorganisms. It is a critical component of many different proteins – enzymatic and non-enzymatic – and therefore plays a vital role in many biological functions. These functions include but are not limited to: oxygen transport and storage, neurological function, detoxification and lipid synthesis in the liver, and roles as electron carriers in electron transfer reactions. A key player in the management of iron redox status is a class of enzymes called the multicopper oxidases (MCOs). Those MCOs who demonstrate specificity towards Fe^{2+} are further classified as ferroxidases, which couple the oxidation of iron to the reduction of molecular oxygen. This study extends the structural and functional characterization of the ferroxidase Fet3p from *Saccharomyces cerevisiae* (Baker's Yeast). The pH dependence of enzymatic catalysis for Fe^{2+} by Fet3p has been examined in comparison to, and in competition with, various iron chelators to probe the nature of Fet3p Fe^{2+} binding and subsequent oxidation to Fe^{3+} . Oxygen uptake experiments have focused on an iron chelator 4-(2-Thiazolylazo)resorcinol (TAR) which has been recently shown to exhibit unique UV-Vis spectral changes in response to the redox status of iron. We are currently investigating the spectroscopic features of TAR for use in a continuous assay of ferroxidase activity by Fet3p. Additionally, we are probing the nature of substrate specificity using a variety of Fet3p mutants.

COLLEGE OF Arts & Sciences

Biochemistry

Encapsulation and Delivery of Trastuzumab into human breast cancer cells using Cholestosome™

Thao Huynh

Sponsoring Professor

Dr. Mary McCourt

Dr. Lawrence Mielnicki

According to the American Cancer Society, 1 in 8 (12%) of women in the United States develop invasive breast cancer. Among those individuals, approximately 25 to 30% of breast cancer cells exhibited elevated HER2 levels. HER2 positive breast cancers identified by a pathologist typically exhibit amplification of the HER2 gene resulting in an overexpression of HER2 receptors.² The HER2 receptor (Human Epidermal Growth Factor Receptor 2) is a member of the epidermal growth factor family important for the intracellular signaling and regulation of cell growth. Trastuzumab (Herceptin®) is an IgG1 monoclonal antibody that has been proven to be effective in HER2 positive patients. Trastuzumab binding to HER2 interferes both directly and indirectly with downstream intracellular signaling pathways.^{3,4} Unfortunately, less than about 35% of patients benefit from treatment with trastuzumab while the remainder exhibit initial or acquired resistance to treatment. Importantly, brain metastasis frequently occurs in trastuzumab treated patients.⁶ This population of resistant patients inspires efforts towards a more effective delivery system for trastuzumab, including those that can cross the blood-brain barrier. This laboratory has developed a neutral lipid based vesicle (the Cholestosome™), that uses naturally occurring lipids for the delivery of a wide variety of therapeutics, including small molecules, antibiotics, peptides, and proteins. Previous work has shown Cholestosome™ -mediated delivery of FITC-labelled peptides into various mouse tissues (including brain) after oral administration. The Cholestosome™ can therefore potentially be used to orally deliver compounds for which intravenous administration is the only effective dosing route. The present studies describe the initial efforts at Cholestosome™ encapsulation of trastuzumab.

COLLEGE OF Arts & Sciences

Biochemistry

Pesticides on Produce

Olivia Schroeder

Claire Schoemick

Sponsoring Professor

Dr. Robyn E. Goacher

The contamination of pesticide residues on produce raises vital health concerns for the consumers. Pesticides have become more commonly used as a means to facilitate food production for a constantly growing population. This reliance on pesticides is controversial because of potential unintended longstanding effects on both the environment and on human health. The aim of this project is to assess the level of pesticide residues on organically labeled apples and non-organic "dirty" apples. QuEChERS extraction method (quick, easy, cheap, effective, rugged, and safe) will be used followed by gas-chromatography mass spectrometry or liquid chromatography-tandem mass spectrometry. A variety of different pesticide classes will be tested and residues will be compared to their Maximum Residue Limit (MRL) on the United States Department of Agriculture Database. Additionally, the use of baking soda as a produce wash to remove pesticides will be analyzed to determine if this is a sufficient means to remove pesticides prior to consumption.

COLLEGE OF Arts & Sciences

Biochemistry

EFFECTS OF CARBON DIOXIDE ON FLUCONAZOLE SUSCEPTIBILITY IN CRYPTOCOCCUS NEOFORMANS

Kristen Donovan

Sponsoring Professor

Dr. Virginia Glazier

Cryptococcus neoformans, is commonly found throughout the environment within soil worldwide. Inhalation or exposure to C. neoformans can cause life-threatening effects to the lungs and central nervous system. The morbidity and mortality risks of this fungus have made the need for more effective and affordable treatments of high global importance. The antifungal drug, fluconazole, is already administered as a treatment option and often paired with the actions of amphotericin B. Once amphotericin has controlled symptoms, fluconazole can act as an effective long term therapy. We are interested in the effects of carbon dioxide on fluconazole susceptibility in C. neoformans. The effectiveness of fluconazole will be tested under high carbon dioxide conditions because C. neoformans is known to reside in the lungs where CO₂ levels are high. We hypothesize that carbon dioxide will enhance the efficacy of fluconazole. In order to determine the effects of CO₂ on fluconazole activity, MIC and e-test results will be compared at 37°C, or at 37°C in the presence of CO₂. Observing effects under these conditions will lead to a deeper understanding of how physiologically relevant conditions adjust the functions of antifungals. This information will be helpful in the development of better treatment options for C. neoformans.

COLLEGE OF Arts & Sciences

Biology

Temperature Change and Aquatic Plant Growth

Rebecca Dobrasz

Mikia Lewis

Sponsoring Professor

Dr. Brandon Sansom

Global warming and climate change have altered many of the earth's environments. As aquatic environments warm, aquatic plants must adapt. Organisms such as corals have been bleached by these patterns, but freshwater environments respond differently. Being of latitudes accustomed to cold temperatures seasonally, the growth periods have been limited. As temperatures increase within the freshwater systems plants, may grow at even faster rates than usual. In this study, we compare the growth patterns of common water weeds, (Elodea densa) and Frogbit (Limnobium laevigatum), across three different temperatures. Over a month-long period, the plants will be observed, comparing new growth patterns, root and stem formations. Weights of each plant will be taken and compared over the time period in hopes to witness overall growth or loss. By the end of the study, we hypothesize that the increased temperatures will cause plant growth and development to increase. By understanding the response to temperature changes in freshwater environments, the patterns of aquatic plants can be hopefully predicted and understood as a precautionary look at rising temperatures.

COLLEGE OF Arts & Sciences

Biology

Effects of Urbanization on Overall Water Quality of Gill Creek

Dominic Salvatore

Matthew Vogt

Gregory Schuey

Sponsoring Professor

Dr. Brandon Sansom

Urbanization has been found to negatively impact aquatic life and water quality of nearby streams. A common measurement of water quality is biological oxygen demand (BOD), which is defined as the amount of dissolved oxygen (DO) needed by aerobic organisms to break down organic material. As such, BOD can be used to estimate the amount of pollutant organic material in the water. If DO is consumed during the decomposition of organic matter, less is available for aquatic plants and other aquatic life. This study aims to measure the water quality of Gill Creek at several sites with varying levels of urbanization to assess the impact of urbanization on the stream. Three water samples will be taken from five sites on Gill Creek ranging from headstream to downstream. The initial DO will be measured for each sample, and then samples will be kept in a cool, dark environment for five days, at which point the final DO will be measured. BOD will be determined at each site and compared across sites to assess the overall stream health and impact of urbanization. We expect to observe that BOD will increase as we travel downstream, meaning water quality decreases, because urbanization increases downstream. Understanding the relationship between stream water quality and urbanization can provide insight into creating interventions or initiatives to improve aquatic life in areas impacted by urbanization. Improved aquatic life and water quality can lead to healthier lives for people and animals that depend on water for survival.

COLLEGE OF Arts & Sciences

Biology

METHICILLIN RESISTANCE IN STAPHYLOCOCCUS ASSOCIATED WITH WHITE TAIL DEER

Rachisan Djiake Tihagam
Linh Vuong

Sponsoring Professor

Dr. Mark Gallo

Multiple-drug-resistant strains of Staphylococcus are a major concern in human medicine. Humans are not the only hosts for Staph however and domestic as well as wild animals have been found to also contain these virulent strains of Staph. Resistance to the beta-lactam antibiotic methicillin was previously shown to be due to the penicillin-binding protein known as MecA and strains harboring this are known as MRSA. The goal of this study is to determine if strains of Staphylococcus associated with white tail deer, *Odocoileus virginianus* also share the same mechanism, and hence underlying genes, as those found in human-associated MRSA (HA-MRSA). Polymerase chain reaction (PCR) was used to address this issue to reveal the presence of *mecA* as well as surrounding genes.

COLLEGE OF Arts & Sciences

Biology

ISOLATION OF BACTERIOPHAGE IN STAPHYLOCOCCUS SPECIES

Janelle Fancher
Shania van Nuland
Maria Kajdasz

Sponsoring Professor
Dr. Mark Gallo

Pathogenic Staphylococcus strains that are antibiotic resistant can cause infections that are difficult to treat. The use of bacteriophage in treatment of Staphylococcus aureus infection has been proposed as a possible alternative to antibiotics. Isolation and identification of new bacteriophage is an exciting area of research that may yield novel treatments for infections that have been challenging to eliminate by traditional means. One previously unexplored source of Staph and their corresponding phage are strains associated with wild animals. In this study, Staph were isolated from white tail deer, Odocoileus virginianus. The resulting bacteria were analyzed for the presence of lytic phage that were active against RN4220, a permissive strain of S. aureus. Sixteen independent bacteriophages were detected and their range of activity on other Staphylococcus species will be determined. Genetic and morphological properties will be explored.

COLLEGE OF Arts & Sciences

Biology

Isolation of Glycoside Hydrolases Towards Goal of Universal Blood

Dayron Leyva

Sponsoring Professor

Dr. Mark Gallo

Blood transfusion is one of the most used treatment in a hospital setting. Sometimes, this treatment can be a challenge due to the different type of blood a person can carry. Sugars found on the surface of blood are responsible for their antigenic properties which give rise to A, B, and O type blood. Removing these sugars should produce a universal blood. It is known that many bacteria can break down complex carbohydrate polymers by using glycoside hydrolase. Glycoside hydrolases are enzymes which can reduce glycosidic bonds. In this study, we are trying to find enzymes that are able to break N-acetyl galactosamine linked in an alpha 1,3 configuration to fucose, A type blood, or Galactose linked in a alpha 1,3 configuration to fucose in B type blood.

COLLEGE OF Arts & Sciences

Biology

RATE OF pGLO LOSS WHEN SELECTIVE PRESSURE IS REMOVED

Jessica Nguyen

John Klem

Sponsoring Professor

Dr. Mark Gallo

Plasmids are extra chromosomal elements that are normally found in most bacteria. One plasmid, pGlo™, is used in E. coli for many experiments, especially as part of the Advanced Placement Biology curriculum. This plasmid contains the green fluorescent protein gene under control of the arabinose promoter, the beta lactamase gene whose product provides beta-lactam antibiotic resistance, an origin of replication, as well as a multiple cloning site. The plasmid is retained in the cell due to selective pressure of the antibiotic. However, very little experimentation has been done on the rate of the loss of plasmids in bacteria. Plasmid loss will be explored when under different selective pressures, namely the additional cost of expression of GFP protein on ability to compete for resources.

COLLEGE OF Arts & Sciences

Biology

Actinomycin D Effects on HeLa Cervical Cancer Cells

Logan Slother
Anthony Di Cecca

Sponsoring Professor

Dr. Robert Greene

Cervical cancer is the fourth most prevalent variety of cancer found in women worldwide. Cervical cancer arises from abnormal cell growth in the cervix. Treatment of the HeLa cervical cancer cells line with Actinomycin-D directly stimulates apoptosis. Actinomycin-D is a chemotherapy medication produced from the bacteria *Streptomyces parvullus* which inhibits transcription by binding DNA at the transcription initiation complex and prevents elongation of the RNA chain by RNA polymerase. Various concentrations of Actinomycin-D were used to determine the most effective apoptotic treatment for the HeLa cells, with DMSO as a negative control and staurosporine as a positive control. The treatments were performed for 24 hours and then analyzed for stages of apoptosis. The precise mechanism of Actinomycin-D-induced apoptosis on cervical cancer cells is still poorly understood. We also treated HeLa cells over the course of 72 hours using a single concentration to determine the effectiveness of Actinomycin-D over an extended treatment time. Future research could be performed using Actinomycin-D in conjunction with phototherapy to more effectively induce apoptosis in cervical cancer cells.

COLLEGE OF Arts & Sciences

Biology

Vitamin D Effects on MCF-7 Cells

Amanda Ventrella

Audrey Dunn

Sponsoring Professor

Dr. Robert Greene

Breast Cancer begins when the cells in the breast tissue begin growing uncontrollably, forming a benign tumor and eventually spread and grow enough, turning into a malignant tumor. There is growing evidence that treatment of the MCF-7 luminal breast cancer cells line with Vitamin-D directly stimulates apoptosis. Vitamin-D is a fat-soluble vitamin that can be obtained from the diet, as well as a seco-steroidal prohormone that is produced in the skin by UV-light. However, the precise mechanism of Vitamin-D-induced apoptosis on Breast Cancer cells is still poorly understood. To better characterize this effect, we treated MCF-7 cells with different concentrations of vitamin-D and measured their efficacy at 24 hours. We also treated MCF-7 cells over the course of 72 hours to determine how effective vitamin-D was over an extended treatment time.

COLLEGE OF Arts & Sciences

Biology - Biotechnology

The unsuspected competition between green and purple sulfur bacteria in Fayetteville Green Lake

Joy O'Brien

Sponsoring Professor

Dr. Cassandra Marnocha

Dr. William Edwards

Fayetteville Green Lake is a meromictic lake located outside of Syracuse, NY. Due to the lack of seasonal mixing and its unique sulfidic conditions, below the chemocline of Fayetteville Green Lake there is an interesting combination of purple and green sulfur bacteria at approximately 22 meters in depth. Green and purple sulfur bacteria both prefer sulfide as an electron donor during photosynthesis, which means that it would be expected for one bacterium to outcompete the other. Therefore, the coexistence of these two types of sulfur-cycling bacteria is interesting in terms of competition for resources because they are normally known to disperse throughout a lake based on their needs. For example, green and purple sulfur bacteria tend to segregate based on light intensity, but this is not the case in Fayetteville Green Lake. The coexistence of green and purple sulfur bacteria may be facilitated based on their metabolic differences. For instance, green sulfur bacteria are known to deposit sulfur globules extracellularly compared to purple sulfur bacteria which keeps its sulfur inside the cell. Purple sulfur bacteria may be reliant on the sulfur that green sulfur bacteria are depositing. To determine the conditions required for green and purple sulfur bacteria to co-exist in the environment of Fayetteville Green Lake, we observe the interactions between lab strains from each genus in co-culture. This allows us to better understand how bacteria contribute to the sulfur cycle throughout a meromictic lake such as Fayetteville Green Lake.

COLLEGE OF Arts & Sciences

Biology & Life Sciences

Trees of Niagara

Ashley Eisenhauer

Carly Kleitz

Sponsoring Professor

Dr. Brandon Sansom

Dendrology data can be a great management tool for the university. Proper maintenance schedules can be made using accurate and updated data so that the university can maintain its aesthetics. The purpose of this study is to update a prior databases started in 2016 and to provide an overview of tree species and condition of woody trees on the Niagara University Campus. In this study, we compiled a database of trees on campus. Each tree was spatially indexed with a handheld GPS, identified to species, and measured for the diameter at breast height (DBH) and tree height. Additional observations such as tree health and local habitat conditions were noted when appropriate and each tree was photographed to confirm species identification. The results of this survey will help Niagara University better understand the health of woody trees across campus, and provide a user-friendly database for university staff to use for maintenance purposes.

COLLEGE OF Arts & Sciences

Botany

The Distribution of Select Invasive Species in De Veaux Woods State Park and the Niagara Falls Gorge

Joy O'Brien

Elizabeth Kelsey-Gossard

Noah Kaczmarek

Emily O'Brien

Sponsoring Professor

Dr. Brandon Sansom

An invasive plant species is defined as a non-native species that inhabits an ecosystem and has the potential to cause harm to the environment and surrounding areas. There are a number of invasive species in Niagara County, NY, specifically in De Veaux Woods State Park (an old growth forest) and the Niagara Falls Gorge (a fragmented ecosystem). Because these parks represent two different ecosystems and are relatively close to each other, we aim to identify three different invasive species in each park and measure differences in distribution via the point transect method. The three different species that we will focus on are: Canada Thistle (*Cirsium arvense*), Common Reed grass (*Phragmites australis* var. *australis*), and Common Buckthorn (*Rhamnus cathartica*). Even though these plant species are present in two different ecosystems, they have different impacts on their surrounding environments. This study will hopefully result in the findings that invasive species are distributed differently in different types of ecosystems and their distribution is impacted by fragmentation. This can help expand the understanding of the invasive species movement in western New York. The two state parks can use information and studies such as this to plan their management of invasive species according to the type of environment. The quantity of invasive species may depend on if their habitat is fragmented or not; which is the hopeful finding of this study.

COLLEGE OF Arts & Sciences

Chemistry

Metal Analysis of Fresh Water Bodies of Western New York by Atomic Absorption Spectroscopy

Zachary Augustyn

Sponsoring Professor

Dr. Robyn Goacher

With increasing rates of pollution, fresh water is becoming more of a luxury across the world. Western New York being on the edge of two of the largest bodies of fresh water on the planet, Lake Erie and Lake Ontario, has seen much attention in regards to environmental protection, but how successful have these methods been in recent years to reduce the amount of pollution being introduced into these fresh water bodies? Toxic metals are one of the top concerns when it comes to safety of water. Toxins can originate from massive industrialization sites, poor waste disposal, and maritime trading between the US and Canada, toxic metals can easily leech into these large bodies of water and can cause long lasting detrimental effects on the ecosystem and aquatic life. One method to analyze the amount of toxic metals these bodies of water contain is by the use of AAS (Atomic Absorption Spectroscopy), which is primarily a quantitative method of analysis solely used to determine the concentration of specific elements, in this case lead, copper, and iron in a given sample. By determining if these metal species do in fact exceed safety levels established by the EPA in these water system, greater lengths can be taken in order to protect these fragile bodies of fresh water.

COLLEGE OF Arts & Sciences

Chemistry

Applications of Spectroscopy for the Identification of Counterfeit Currency

Brianna Kehoe

Sponsoring Professor

Dr. Robyn E. Goacher

As a society we are all for the creation of new technology that makes our lives easier but often times we don't recognize the negatives that also come with these advancements. With these new developments in technology and high-quality technology becoming more readily available and affordable for the masses, it has also become easier to create extremely realistic counterfeit bills. Today, analysis techniques such as X-ray fluorescence, IR spectroscopy, UV spectroscopy, and MS are used to determine the authenticity of alleged counterfeit bills since color changing markers and eyesight as methods of identifying counterfeits have become too inaccurate. This poster evaluates literature to compare time, cost, how much sample is needed, if the sample is destroyed, resolution, detection limits, rate of false positives and false negatives for counterfeit identification and if results can be replicated over time to determine what technique is best for determining authenticity. Additionally, the accuracy of the lab grade instruments used by the police versus the handheld instruments that are available to the masses are to be compared. Determining a technique that is both the most efficient and most accurate way to determine authenticity of alleged counterfeit bill is important to putting a stop to this growing crime and being able to keep up with correct identification of counterfeit bills as technology continues to advance and counterfeits continue to become more realistic.

COLLEGE OF Arts & Sciences

Chemistry

STUDIES TOWARD THE SYNTHESIS OF ENT-ARTEMISININ, A POTENTIAL ANTIMALARIAL COMPOUND

Emily Steiner

Sponsoring Professor

Dr. Luis Sanchez

Artemisinin is a natural product isolated from the plant *Artemisia annua* that is currently the fastest-acting treatment available against *Plasmodium falciparum*—the protozoan parasite that causes the deadliest form of malaria. The low bioavailability of this compound and its short half-life, however, make the cost of artemisinin therapies very high. Anti-malarial combination therapies involving artemisinin are employed to avoid the development of resistance to the drug by the parasite, as recommended by the World Health Organization.

Artemisinin's structure contains a unique peroxide bridge that is believed to be responsible for the drug's mechanism of action. We gather that the exceptional biological activity of this compound may originate in the fine-tuned chemical reactivity of its peroxide bridge, rather than the topology of the structure itself. Consequently, we hypothesize that its enantiomer (ent-artemisinin)—a yet unreported compound—could exhibit comparable anti-malarial properties. Seeking an affordable synthetic route, our current goal is to develop a reaction sequence to produce ent-artemisinin from zingiberene, a compound found in ginger oil. Thus far we have successfully isolated a ginger oil fraction in which zingiberene is the primary component (as per NMR analysis) and further purified it via a series of reactions. We have recently begun studies into the synthesis of the ent-artemisinin precursor molecule, ent-amorphadiene, from zingiberene, and have been analyzing this process via LCMS. If this proposed synthetic route is successful, we believe that the low cost and high availability of ginger oil would allow for the large-scale production of ent-artemisinin.

COLLEGE OF Arts & Sciences

Chemistry

"Bones" Forensic Report-card

Reilley Larkin

Sponsoring Professor

Dr. Robyn E. Goacher

Dr. Temperance 'Bones' Brennan is the world-renowned forensic anthropologist on FOX's long running show "Bones". She along with her FBI partner Booth and their team of 'squints' work to solve murders using forensic science. While Bones focuses on the skeleton of the victims, another member of the team, Hodgins, focuses more on his bugs and instruments. The instrument that is seen most often in the show is gas chromatography-mass spectrometer (GC-MS). The viewer never sees the samples tested, but the data for the instrument is flashed on screen. In the episode "The Eye in the Sky", Hodgins detect palm oil and Thai food in the victim's wounds. This poster will compare actual forensic procedure using GC-MS for trace analytes to Hodgins results to determine if the sciences on the show flunk or hit the mark.

COLLEGE OF Arts & Sciences

Chemistry

A proposal to study common chemicals found in cosmetics and how they transform in the environment

Jenna Schlosser

Sponsoring Professor

Dr. Robyn Goacher

Chemicals are found in cosmetics that are used every day that are used by many people worldwide. In America, the FDA has recently been cracking down on what is in these products and while they may be safe for use, our goal is to study the impact that these chemicals have on the environment once they are used. Dimethicone, Polyvinylpyrrolidone (PVP) and sodium lauryl sulfate are three common chemicals used in various cosmetics including conditioners, liquid facial makeup, and moisturizers. This poster presents a research proposal for how one could measure the affect these chemicals could have on the environment. This may be studied by LC-MS, GC-MS, or NMR/FTIR to identify the chemicals as well as studying the alkalinity and activity of the three compounds of interest.

COLLEGE OF Arts & Sciences

Chemistry

Drinking Water Quality

Elaina Spendio
Joshua Pitruzzella

Sponsoring Professor
Dr. Robyn Goacher

The quality of drinking water is becoming an issue that concerns many places around the world today. This is important because humans and animals need water to survive. If the water they are ingesting contain toxic components, it could lead to the development of severe illness and many other health-related issues. The toxic components tested for in this experiment are lead, copper, and fluoride. There are safeguards in place to prevent these toxins from contaminating drinking water however, there are ways that can't be easily prevented or kept up with consistently. These toxins can contaminate drinking water through microorganisms (parasites and bacteria), industrial waste, natural deposits, improper disposal, etc. This experiment aims to identify toxic components in a variety of drinking water sources using atomic absorption spectroscopy to detect copper and lead, and an ion-selective electrode method to detect fluoride. The goal of this experiment is to identify which water samples from a variety of sources contain toxins and what toxins are present in each sample.

COLLEGE OF Arts & Sciences

Chemistry

Using 2D NMR for Advanced Molecular Characterization

Emily Steiner
Gregory Ernst

Sponsoring Professor

Dr. Robyn Goacher

Nuclear magnetic resonance (NMR) spectroscopy is a valuable instrumental technique used by chemists for the structural determination of analyte compounds. This instrument operates based on the principle that nuclei have spin, and in the presence of a strong magnetic field, these spin states split to have different energy levels. The chemical environment imparted on nuclei as a result of their surrounding electron clouds influences the degree to which this energy difference occurs. The radiofrequency energy absorbed and subsequently induced by excited analyte nuclei represents the difference in energy between spin states, and thus provides information about the relative chemical environment of the different nuclei of a molecule. This principle is most commonly applied to both hydrogen and carbon nuclei. While spectra representing the individual nucleus types (1D NMR) already provides valuable insight regarding molecular structure, combinations of one dimensional spectra into 2D spectra may be used to further deduce information about bond connectivity and stereochemistry that would otherwise have been left undetermined.

Given the complex, yet highly valuable nature of 2D NMR to chemists, we believe it is crucial that chemistry students develop the skills associated with structural determination from such instrument data. Here we present a laboratory exercise we developed to acquaint students with both the operation of the NMR instrument and the interpretation of advanced spectra for complex compound identification.

COLLEGE OF Arts & Sciences

Computer & Information Science

Internet of Things and Smart Campus

Bryce Molnar

Alex Farkas

Cynthia Hunt

Blair Swanick

Sponsoring Professor

Dr. Yonghong Tong

Internet of Things (IoT) devices are sweeping the nation in popularity, captivating the minds of security professionals and techies alike. In this ever changing world one thing that has yet to be changed is the University Campus. Internet of Things: Smart Campus, a smart solution for Niagara University, is a project that focuses on the development of a more secure learning environment and a more sound living environment, no pun intended. Internet of Things objects can be used to protect doors, windows, and students from unwanted disturbances and issues. It is with this knowledge that this project found it's roots and is searching for the answers.

COLLEGE OF Arts & Sciences

Computer & Information Science

Providing Accessibility through the Design and Development of Mobile Applications

John Stoddard

Sponsoring Professor

Dr. Yonghong Tong

The display will feature a poster detailing the process it takes to create a mobile application. Two applications, both created for android devices, will be featured. One used for surveying the WNY area and collecting data on what accessibility features local restaurants provide to people with disabilities. The other is an electronic version of a handbook that informs first responders on how to properly care for specific disabilities. The presenter will be going over the work required to develop these applications and how using mobile technology can increase accessibility options in all fields.

COLLEGE OF Arts & Sciences

Computer & Information Science

Cyber Warfare: Government-Funded Private Operations

Caleb Goldfus

Sponsoring Professor

Glenn Papp

This research examines cyber security and cyber warfare with interest in both government and civilian efforts. Comparisons of the capabilities, history, and potential of both government and civilian entities are made with respect to the effects that these entities have on government operations and the quality of life of the average citizen. Information is gathered from various sources, to include official reports, in order to analyze as accurately as possible the capabilities and actions of US cyber defense efforts which are not disclosed to the public. This research seeks to identify how US government and private cyber operations compare to one another, the weaknesses that currently exist within these operations, and possible changes and solutions that can be utilized to augment these operations.

COLLEGE OF Arts & Sciences

Criminology & Criminal Justice

Awareness and Perceptions of Domestic Violence

Kaitlyn Walek

Sponsoring Professor

Dr. Dana Radatz

When a victim of domestic violence tries to leave the abusive relationship, they may need to overcome stigmas or negative perceptions other may have of them due to their victimization. Through education programs and awareness events, the negative perceptions and stigmas can cease to exist and encourage victims to leave the abusive relationship. During a domestic violence awareness event, 42 surveys were completed by attendees while exiting the event and asked them how the event impacted their perceptions on domestic violence and how they view victims and offenders fo domestic violence. The purpose of this study was to explore the perspectives of attendees of a domestic violence event on domestic violence.

COLLEGE OF Arts & Sciences

Criminology & Criminal Justice

HONORS THESIS: A REVIEW OF BAZE V. REES, AND ALL LETHAL INJECTIONS IN TEXAS SINCE 1982

Richelle Kloch

Sponsoring Professor

Dr. Talia Harmon

This presentation will examine the continued validity of the United States Supreme Court's ruling in *Baze v. Rees*, 128 S. Ct. 1520 (2008), which upheld the procedures of the State of Kentucky in executing death row inmates using a three-drug cocktail. The court based its decision on the fact that, at the time, a one-drug protocol was never implemented by any other State, and assumed that the manufactured drugs used would always be reliable. The assumptions and basis for the plurality decision in *Baze v. Rees* will be juxtaposed with the actions of several pharmaceutical companies, which have brought lawsuits to prohibit the use of their drugs for execution purposes. The limited supply of drugs needed to meet protocols forced States to rely on compounding pharmacies. Compounding pharmacies can produce drugs that are "near-copies" of drugs that are or were commercially available. This issue will be explored deeper in order to test the integrity of compounded drugs and their efficacy in execution settings. An examination of the history of evolving methods of Capital Punishment will be done to understand the underlying reasons and opinions in regards to the death penalty. Lastly, a big portion of this thesis will be quantitative research, which will quantify the Capital Punishment problem by generating data from all lethal injections in Texas since 1982. Texas changed from a three-drug cocktail to a one-drug cocktail. Examining this data will help determine whether the one drug protocol is better, more constitutional, and less painful.

COLLEGE OF Arts & Sciences

English

**“Cuz I'm Spider-Man, and I'm not the only one”:
A Web of Personal Identity and Great Expectations in
*Spider-man: Into the Spider-Verse***

Sara E. Anderson

Sponsoring Professor

Dr. Daniel Pinti

This paper offers an analysis of the complex network of familial, personal, and sometimes inter-dimensional relationships depicted in the animated film *Spider-Man: Into the Spider-Verse*. Specifically, a discussion of how identity, whether personal, professional, or tied up in the mantle of ‘Spider-Man,’ has the power to create or disrupt these relationships, and why the portrayal of these themes is significant for this cultural moment.

COLLEGE OF Arts & Sciences

English

(Re)Forming Relationships: Dismantling Binaries and Hierarchies in Asterios Polyp

Julia Arena

Sponsoring Professor

Dr. Daniel Pinti

According to Caroline Levine in her book, *Forms*, relationships between the two elements in a binary often result in a hierarchical system that leaves one binary component underprivileged. Binaries naturally create groupings for items, ideas or persons to be divided by. In literature, the intersection of two opposing binaries result in hierarchies that can be displayed in various ways. David Mazzucchelli's *Asterios Polyp* explores how two opposing binaries intersect. Via the structured application of design and narrative, Mazzucchelli's story of the main characters, Hana and Asterios, shows how binaries intersect and overlap in ways that work to dismantle the hierarchy that the binary relationship itself has created.

COLLEGE OF Arts & Sciences

English

Rejecting the Color Line: Using Subcultural Theory to Grant Wei-Chen the Power of Racial Resistance in Gene Luen Yang's American Born Chinese

Tyler Bingham

Sponsoring Professor

Dr. Daniel Pinti

Traditionally, scholarship on American Born Chinese centers around the novel's main character, Jin Wang. However, equally interesting is the novel's secondary character, Wei-Chen. Wei-Chen, like Jin, experiences white resentment over his race. Although, unlike Jin, who literally transforms into a white American teenager, Wei-Chen enters the "import car scene," an Asian American subculture. The act of choosing not to reject his race but enter into a space in which his race is powerful, is a rejection of white America. Fundamentally, Wei-Chen's subcultural affectation allows him to find pride in his racial identity and resist the normative. While the book's ending suggests Jin Wang, recently changed back into a Chinese-American teenager, will teach Wei-Chen how to come to grips with his race in an American context, perhaps Wei-Chen has a lesson to teach Jin Wang about racial pride and looking beyond the box that is their hegemonically white American context.

COLLEGE OF Arts & Sciences

English

Young Adult Exile and the Reconstruction of Community in Alexandra Bracken's The Darkest Minds

Mallory Ronan

Sponsoring Professor

Dr. Daniel Pinti

This paper applies Caroline Levine's methodology in her book, *Forms*, to Alexandra Bracken's dystopian YA novel, *The Darkest Minds*. In this story, young people who have survived a disease called IAAN have been exiled to camps by their parents because the adults are afraid of the unusual abilities their children have since acquired. Ruby, the main character, escapes the camp and joins forces with three other young people to search out the "Slip Kid's" camp, where escapees with various powers can live without fear of being taken back to imprisonment. Through countless trials, Ruby learns how to trust and become a part of a community again. Levine's ideas about how literary-sociological forms like bounded wholes, hierarchies, and networks are useful in analyzing the importance of such forms as they are manifested in this novel.

COLLEGE OF Arts & Sciences

English

The Restriction of Civil Liberties in *The Handmaid's Tale* and Québec

Arianna Gabriel

False Dilemmas: Undercutting *Gender Binaries* through Three Guineas and *The Handmaid's Tale*

Tyler Bingham

Sponsoring Professor

Dr. Jamie Carr

Though written in different historical periods and national contexts, Virginia Woolf's 1938 antifascist treatise *Three Guineas* and Margaret Atwood's 1985 novel *The Handmaid's Tale* have much in common. Each extensively researched the treatment of women in their own contemporary moments to illustrate that gender oppression was a part of liberal society as well as a totalitarian one. Each is relevant still today. Using Woolf and Atwood as inspiration, this panel critically and creatively engages literature as a lens through which to examine patriarchal and state repression of women in contemporary societies.

COLLEGE OF Arts & Sciences

Environmental Science

How Aquaponics Affects Plant Growth

Hannah Frasier
Danielle Goggin

Sponsoring Professor
Dr. Brandon Sansom

A huge concern for the world is feeding the population without destroying the environment. Current agriculture practices are not efficient nor sustainable. Use of chemical fertilizers contributes to eutrophication of bodies of water and pollution. We need an agriculture system that is both effective and efficient. Aquaponics is a form of hydroponics in which the nutrients supplied to the crops come from the waste that living fish excrete. It is said that aquaponics can produce a higher yield of crops faster than regular farming techniques, and is less harmful to the environment. In this study we test the feasibility and efficiency of aquaponics using a miniature setup that will grow lettuce. Lettuce seeds were started in rapid grow plugs and were transferred to the aquaponics system after 14 days. The aquaponics system consists of basin of water, floating styrofoam planks, and a fish tank. Nutrient rich water is recirculated from the fish tank to basin tank holding the styrofoam planks and lettuce, and drains back into the fish tank. Lettuce growth was monitored weekly, observing the total height and biomass of each lettuce head. Preliminary results suggest that, the aquaponics system is capable of producing lettuce at a faster rate than standard farming practices. Knowing that aquaponics is more effective, efficient, and environmentally friendly than traditional agriculture has huge implications on the world. If more farms switched to aquaponics, it could possibly be one solution to world hunger and would help to vastly decrease pollution.

COLLEGE OF Arts & Sciences

Environmental Science

Herbalism: A Focus on Turmeric and St. John's Wort

Hannah McCrady
Kori Kammerdeiner
Taylor Donoughe

Sponsoring Professor
Dr. Brandon Sansom

Many pharmaceutical products, whether prescription or over-the-counter, have ultimately been derived from chemicals occurring in botanicals. With limited access to healthcare by large portions of society people are now turning to botanicals for their medical needs. Examples of such botanicals include St. John's Wort, used as a selective serotonin reuptake inhibitor (SSRI), and Turmeric root, known for its anti-inflammatory properties, have been harvested and utilized in various civilizations for millennia. In Turmeric root, the chemical curcumin is responsible for reducing inflammation and pain related with such, and in St. John's Wort, hypericin, pseudohypericin and hyperforin are utilized as antivirals and antidepressants. Many similar medications may invoke serious side-effects and reactions, whereas ingestion of the above chemicals in their natural form lessens the likelihood of complications. Preliminary results from the literature review suggest that in multiple studies, a significant number of participants experienced the same amount of relief with fewer ill side-effects than those taking the same compounds in chemically engineered substances. Using the above chemical compounds and similar extracts, medicine may be made safer and more affordable.

COLLEGE OF Arts & Sciences

Environmental Science

Invasive species diversity between old Niagara campus and present Niagara campus

Charles Roth
Jose Gomez

Sponsoring Professor

Dr. Brandon Sansom

Ecological or economic harm can be caused by invasive species in a new environment where it is not native. These species are responsible for extinction of native life, reduced biodiversity, and altering habitats. Since Niagara University has relocated to the Lewiston Road location, the old campus has had an opportunity to acquire greater diversity of invasive species due to less maintenance. Some common invasive species in Niagara County that may be found are buckthorn, knotweed and garlic mustard. In this study, we will compare invasive species from the old Niagara University campus located in De Veaux Woods State Park to, while also looking at the present-day campus located on Lewiston Road. We hypothesize that the old campus will have higher invasive species abundance, diversity, and ecological impact. Diversity indices, such as Shannon or Simpson's index, will be used in order to test this hypothesis. The analyses listed above will help us determine which location has the highest species diversity, species evenness and species richness through Shannon and Simpson's index. These statistical tests will account for both abundance and evenness in the species that are present. The results of this study will enable further comparisons between invasive species at present-day Niagara University, De Veaux Woods State Park, and other sites in the county.

COLLEGE OF Arts & Sciences

Environmental Science

A device for high resolution sampling within the monimolimnion of a meromictic lake

Kaleigh Block

Sponsoring Professor

Dr. William Edwards

Dr. Cassandra Marnocha

Here we present a new water sampler for taking samples in real time and for conducting water chemistry research. This device is a modified water sampler that incorporates conductivity and temperature sensors, which allows us to take in situ samples in Fayetteville Green Lake, a meromictic lake with a hydrogen sulfide monimolimnion. Green Lake has a plate, or a thin layer, of green and purple sulfur bacteria in the water column. To investigate the physical and chemical properties of this plate, the sampler will be lowered to the depth of the plate, and samples from the water column will be taken above, below and in the plate. The down unit, consisting of temperature and conductivity probes, will be initiated to collect data at varying depths. This data will be collected on a microcontroller and communicated to a surface unit via tether. Data will be transmitted in real-time on the electronic microcontroller. The microcontroller will then initiate the release system, which is controlled by a waterproof servo motor. This sampler will improve our ability to investigate the lake because we will obtain samples with more precision and control due to the microcontroller communicating data in real-time. This will also improve our existing sampling mechanisms because it permits sampling and data collection simultaneously. Deploying our device in the lake will allow us to attain a better understanding of the properties of the plate, and this is of importance because our findings may be used as a model for similar meromictic lakes.

COLLEGE OF Arts & Sciences

Gerontology

Knowledge and Attitudes of College Aged Individuals in regard to the Human Papillomavirus Vaccine

Sophia Smith

Sponsoring Professor

Dr. Mark Gallo

This project is designed to collect data on knowledge and attitudes about the human papillomavirus (HPV). A major goal of this study is to examine adult age differences in experiences with the HPV vaccine, knowledge, and attitudes for the purposes of cancer prevention.

Gerontology

Age Differences in Knowledge and Views about Cancer

Sophia Smith

Sponsoring Professor

Dr. Susan Mason

Cancer is a worldwide public health problem, and as people age the incidence of cancer increases significantly. Additionally, previous research has shown that cancer is one of the most feared diseases and is generally viewed as a 'death sentence'. Such negative perceptions may hinder a patient's adherence to screening/treatment programs, negatively impact the patient-physician relationship, and impede on early detection. Likewise, it is important to consider factors like cancer literacy, physician communication and recommendation, and history of cancer, which may influence a patient's fearful and fatalistic perceptions. The purpose of this study is to evaluate what factors may influence the formation of pessimistic or optimistic cancer perceptions, and to understand how such perceptions impact a patient's health-related behaviors and decision making in regard to adhering to and accepting treatments.

COLLEGE OF Arts & Sciences

Gerontology

Adult Age Differences in Counseling: Issues and Views

Amber Catani

Sponsoring Professor

Dr. Susan Mason

Fullen (2018) defines ageism as a social stigma associated with old age or older people, which has effects on an adult's physical health, psychological well-being, and self-perception. Within counseling literature, there is a lack of research on ageism and the impact on older adulthood. Keum (2018) states that age-related attitudes may be a significant factor contributing to the barriers preventing older adults from seeking and receiving psychological help.

The present research considers differences in views between younger and older adults towards counseling. One goal of the research was to determine whether younger and older adults seek counseling for different reasons. Another goal was to determine whether the counselor's age and gender are important factors.

COLLEGE OF Arts & Sciences

History

Power in Refuge: The Urban Black Church from the Great Migration to Civil Rights, 1890-1950

Samantha Kaczor

Sponsoring Professor

Dr. Michael Durfee

Religion and corresponding religious institutions have been a cornerstone of American history, politics, and culture. Religion has historically been a source of power as well. This is no different in America's Black community, reaching back as far as the Revolutionary War era, when the first independent Black religious institutions were founded. Throughout America's history, the Black church has maintained its footing in society beyond being a place of worship and also as a place of refuge and aid. After the Civil War and Reconstruction, the Black church saw a massive influx of change and growth in urban areas, primarily due to the mass migration of Black individuals from the South to these Northern urban centers.

Using a variety of primary sources, such as autobiographies, newspapers, and personal writings/papers, this work looks into the changing ideologies surrounding Black religion, as well as views on how the Black church as an institution could be used as a vehicle for an emerging civil rights movement. In particular, the views of W. E. B. Du Bois and Booker T. Washington regarding religion are contrasted, while Black religious activism on the national versus local levels are compared through studying the lives of Adam Clayton Powell, Jr. and J. Edward Nash. In this analysis of prominent urban leaders within the Black community at the time, it can be made clear that the Black church as an institution, as well as the communities surrounding it, were centers for Black activism even prior to the traditional Civil Rights Movement.

COLLEGE OF Arts & Sciences

History

The Asylum Era: An Examination of the U.S. Mental Health Care System during the Progressive Era

Marissa Seib

Sponsoring Professor

Dr. Shannon Risk

Dr. Michael Durfee

Dr. Hope Russell

This thesis focuses on the reform movements surrounding the U. S. mental health care system during the progressive era with an emphasis on Dorothea Dix and Elizabeth Packard. Dix was one of the first mental health activists in the United States and her efforts led to the creation of over 100 mental health institutions. As Dix neared the end of her life, another mental health activist, Packard, rose to national attention. Packard's wrongful institutionalization motivated her to campaign to change the laws regarding the process of institutionalizing women and children. This thesis proves that the changes made within the U.S. mental health care system have occurred due to prolonged intergenerational activism.

COLLEGE OF Arts & Sciences

Middle Eastern History

Erdogan's Authoritarianism in Art

Ryan Dutschman

Sponsoring Professor

Dr. Mustafa Gokcek

Since the founding of the Republic of Turkey in 1923, the nation that occupies the Anatolian peninsula has seen its fair share of instability and military coups. Yet Turkey stands as one of the most powerful nations in the region, acting as a strategic gate between Europe and the Middle East. It is no stranger to strong, centralized leaders, beginning with Mustafa Kemal and continuing to the present. However, current president Recep Tayyip Erdogan has pushed the boundaries of what it means to be a powerful leader, with severe crackdowns on the press and media, heavy-handed responses to protests, and extreme actions to consolidate power molding him in more the image of an authoritarian leader than a president. Although mostly censored in Turkey, critics have communicated this identity through political cartoons, a form of expression that transcends language barriers and national borders.

COLLEGE OF Arts & Sciences

Middle Eastern History

Secularism in Modern Turkey

Brandon Labend

Sponsoring Professor

Dr. Mustafa Gokcek

The ending of the Ottoman Empire after WWI brought great change to the Middle-East, with Turkey being a prime example of such change. Mustafa Kemal Pasha (Ataturk) is, for better and for worse, regarded as the founding father of Turkey. He transformed Turkey into his image and through his ideals of nationalism, which starkly contrasted with that of the old Ottoman Empire, legitimized his authority over the country. This paper analyzes Ataturk's policies and the legacy that he left behind, both after his immediate death and for Turkey today under Recep Tayyip Erdogan.

COLLEGE OF Arts & Sciences

Middle Eastern History

The Evolution of Arab Nationalism

Matthew Thompson

Sponsoring Professor

Dr. Mustafa Gokcek

For centuries the Ottoman Empire acted as the unifying body of government for the Arab world. However, at the end of the First World War, the Ottoman Empire would be dissolved by the Western powers, and its citizens were divided into smaller states under the British and French Mandates. This sudden divide led to the rise of an intensely nationalist movement across multiple countries, whose goal it was to create a homogeneous Arab state. This was the beginning of the Arab Nationalist movement which remains relevant in the modern day and can be found throughout the remnants of the Ottoman Empire. However, the nationalist movement has failed to remain consistent going through a series of changes. These changes reflect the social and economic circumstances of their respective era, which caused the term Arab nationalism to become fluid, almost unrecognizable from its original state. Evolving from a collective ideology to an authoritarian talking point and in recent years the banner for democratic grassroots movements in the region.

COLLEGE OF Arts & Sciences

Russian History

The Challenge of Censorship to the Russian Intelligentsia between 1750 and 1850

Alexander Bush

Sponsoring Professor

Dr. Mustafa Gokcek

As Russia struggled with Westernization in the late eighteenth and early nineteenth centuries, intellectuals faced a litany of challenges to their existence, such as widespread distrust of Western ideals, rapidly oscillating policies of liberalism and conservatism, and growing censorship. To understand later currents of Russian intellectual thought in the late nineteenth century, it is important to see what challenges faced them during their development into a mature intelligentsia class. Research was conducted by analyzing numerous scholarly accounts of the period, the changes in government policy and the resulting actions taken against intellectuals, as well as the writings and responses of government officials and victimized intellectuals. Overall, this research indicates that censorship was the foremost issue that intellectuals dealt with between the late eighteenth and early nineteenth centuries and that it greatly influenced later currents of thought and political alignment to what they would become.

COLLEGE OF Arts & Sciences

Russian History

Through Differences: Russian Intellectuals in the 18th and 19th Centuries

Joseph Malek

Sponsoring Professor

Dr. Mustafa Gokcek

Russian autocrats made numerous efforts to modernize and Europeanize Russia in the 18th and 19th centuries. Their efforts resulted in the spread of intellectualism and the development of ideas more modern than their own. Outside influences, combined with the modernization efforts at home, also helped shape ideas and movements. Many of these influences had to be adjusted to fit the Russian circumstance. Intellectual groups formed and confronted the problems of serfdom, censorship, and autocracy, and developed solutions that tried to place Russia within a global context. This paper examines the varying degrees of success that Russian intellectual groups experienced in furthering their ideas of modernization in the 18th and 19th centuries. The Decembrist Revolt of 1825 is used as a case study. Slavophiles and Westernizers are also examined. Regardless of how these groups viewed the problems facing Russia, or the solutions they offered, intellectual groups remained at the heart of change in Imperial Russia.

COLLEGE OF Arts & Sciences

Russian History

The Winter War and Its Implications for the Russian Military

Hunter FitzGerald

Sponsoring Professor

Dr. Mustafa Gokcek

The Winter War between Finland and the Soviet Union at the dawn of the Second World War is usually relegated to a footnote in history, but the struggle would shed light on Soviet military ineffectiveness. For the Finnish, the war was one of survival, as defeat or capitulation to Soviet demands would leave them utterly defenseless to Soviet expansion; For the Soviets, the war was one of expansion and of preemptive defense for a future conflict with Nazi Germany. In this presentation, I will discuss Soviet-Finnish relations leading up to the war, including Soviet aggressiveness in foreign policy, especially after the non-aggression pact with Germany was inked. Further, I will speak on military tactics used by both sides, mainly the early failures of Soviet invasion and the successful Finnish defenses. Lastly, I will speak on the end of the war, concluding with the resulting conflict between the Finnish, aligned with Nazi Germany, and the Soviet Union, with World War II in full swing.

COLLEGE OF Arts & Sciences

International Studies

Female Genital Mutilation/Cutting

Arianna Drissi

Sponsoring Professor

Dr. David Reilly

Female Genital Mutilation/Cutting (FGM/C), also known as Female Circumcision, includes all procedures that involve partial or total removal of the external female genitalia. Although it is considered a human rights violation, attitudes on FGM/C vary between the different countries where it is practiced. Using the Human Development Index data on mean years of education, Gross National Income (GNI), and data based on positive attitudes towards FGM/C from UNICEF, I will examine the relationship of those variables on the number of occurrences of FGM/C in 26 African countries. My expectations are that countries with lower education, gross national income, and with positive attitudes towards FGM/C will be more inclined to practice it. This study could potentially be used to examine some of the reasons behind FGM/C and the relationship of these variables on FGM/C occurrences.

COLLEGE OF Arts & Sciences

International Studies

The Effect of Freedom on Human Rights Violations

Meghan Johnson

Sponsoring Professor

Dr. David Reilly

In 82% of countries worldwide, innocent people are tortured. 78 countries have law criminalizing LGBT relationships; 119 out of 160 don't have the right to free speech and are not allowed to discuss the government in a bad light, and one in three countries feel that their home country violates their human rights and acknowledge the existence of human rights violations in their country. While we see some countries working to make improvements, several others are regressing back. My question is: Is the frequency of human rights violations affected by the "freedom" status of certain countries, where freedom is defined by political rights and civil liberties from FreedomHouse. Present research says that a lack of democracy can lead to an increase in human rights violations. This is important because we have documents like the United Nations Universal Human Rights Doctrine in place to prevent these human rights violations, but it is completely unenforceable because it could infringe on the rights of other countries. Human rights violations are present almost everywhere, with countries who have low freedom or democracy levels that also have higher rates of human rights violations, or countries that don't have higher levels of human rights violations despite their low freedom/democracy levels, and countries with high freedom/democracy level that have a higher frequency of human rights violations. My hypothesis is that countries with higher freedom/democracy levels will have less human rights violations, and I anticipate that my data will reflect this hypothesis with some outliers.

COLLEGE OF Arts & Sciences

International Studies

Income Inequality and Protest Activity

Dylan Kubala

Sponsoring Professor

Dr. David Reilly

Participating in a protest is one of the most basic methods that members of a nation can use to voice their opinions directly to their government. Understanding which issues are leading to higher levels of protest activity would be very useful in determining how to better satisfy a population. One issue that would be expected to have a relationship with higher levels of protest would be higher levels of income inequality. Because income inequality is a growing issue on a national and global scale, and protest activities stem from national and global issues, it would be logical to presume that nations with greater income inequality would have higher levels of protest activity. This relationship between the level of income inequality within a nation and the level of protest activity within a nation will be the focus of the study. I hypothesize that nations with higher levels of income inequality will have lower levels of protest activity than nations with lower levels of income inequality.

COLLEGE OF Arts & Sciences

International Studies

International Land Trading and Sovereignty

Colin Leith

Sponsoring Professor

Dr. David Reilly

When people think of the term 'land grabbing', they often revert back to lessons of Western European land grabs throughout Africa, or the United States annexation of the Philippines and Cuba. However, a new form of Imperialism has become extremely prevalent especially in the past few decades. This new form is referred to as economic land grabbing. Countries in debt to other countries have begun selling or leasing their land to larger more developed countries in order to pay back their debts. When in Sri Lanka, I saw this first hand. The Sri Lankan Government had made an agreement with China to build a new port in Columbo, the capital of Sri Lanka. After the creation of the new port was created, Sri Lanka quickly learned that they would not be able to pay the remaining balance to the Chinese. Now, China owns a major port in the capital of Sri Lanka and controls most of the trade going through the small island country. Witnessing this made me interested in researching if there is a trend of economically struggling countries conceding land to other countries with better economies.

COLLEGE OF Arts & Sciences

International Studies

Relationship between State Repression and Resistance

Benjamin Schian

Sponsoring Professor

Dr. David Reilly

This research will look at the relationship between state repression and resistance movements. It will aim to better understand how repressive forces affect collective resistance.

COLLEGE OF Arts & Sciences

International Studies

Trust in the EU

Lukas Wenninger

Sponsoring Professor

Dr. David Reilly

The decision of the British population to leave the EU and the arduous process thereafter has clearly shown that Brexit is an issue of trust that could potentially tear apart the European Union (EU). Leading up to the significant referendum, loads of information on possible consequences were presented repeatedly while stimulating political interest amongst potential voters. However, did those two factors actually matter for the outcome? Since knowledge and political interest are commonly assumed in the research of trust of political institutions, it is of utmost importance to gain a better understanding of their impact. Especially in the case of the EU, due to its size and complex structure, it has significant potential to improve the image of the EU amongst all of its citizens through simple policy changes that focus on stimulating those two aspects. Therefore, I pose the research question if increased knowledge or political interest make European citizens trust the EU more? I argue that in comparison of individuals controlling for political interest, those who have more knowledge about the EU will be more likely to trust in the EU than those who have less knowledge about the EU. Based on data of the Eurobarometer 83.3, a cross-national and cross-temporal survey that monitors public opinion in the EU, I will investigate the relationship between knowledge about the EU, political interest and trust in the EU. Due to their common assumption, the discovered relationship will help us to better understand how big decisions like Brexit can be easily swayed into one or another direction. Furthermore, it will enable the EU to target specific groups of thought more effectively in order to increase the very foundation of its existence trust.

COLLEGE OF Arts & Sciences

Mathematics

Arithmetical Structures on Complete Graphs

Zachary Harris

Sponsoring Professor

Dr. Joel Louwsma

An arithmetical structure on a finite graph is an assignment of positive integers to the vertices so that, at each vertex, the number there divides the sum of the numbers at adjacent vertices, and where the numbers have no common factor. We study arithmetical structures on complete graphs. On a complete graph K_n with n vertices, an arithmetical structure is equivalent to having n positive integers with no common factor each of which divides their sum. We show that, for all positive integers k less than a certain value depending on n , there is an arithmetical structure on K_n for which the largest number in the structure is k . We also show that if p is a prime number greater than a certain value depending on n , there are no arithmetical structures on K_n for which the largest number in the structure is p .

COLLEGE OF Arts & Sciences

Nursing

Nursing Students' Awareness of Human Trafficking

Kaitlin Sawyer

Sponsoring Professor

Dr. Jennifer Scarpena

Dr. Malena Jones

Carol Winkler

Dr. Timothy Osberg

Human Trafficking has become the second largest method of organized crime and is the fastest growing industry globally. Nurses are often one of the only healthcare workers to encounter a victim while they are being held in captivity. Nurses must be made aware of the warning signs of a trafficking victim and receive proper training on how to respond to this type of a situation.

The purpose of this study is to gather data on nursing students' awareness about human trafficking. This will be imperative in identifying gaps in knowledge and determining what more needs to be done at a college level to prepare nurses' assessment skills in recognizing the signs of human trafficking.

This will be a mixed methods study using an original online survey that will be distributed to the participants through email. The sample is an estimated 120 Niagara University junior level, senior level, and accelerated nursing students. The survey consists of fourteen questions assessing their knowledge, awareness, and feeling of preparedness regarding human trafficking.

COLLEGE OF Arts & Sciences

Nursing

The Impact of Horizontal Violence on Student Nurses' Learning

Alexandra Simons

Sponsoring Professor

Dr. Malena Jones

Dr. Mary Kozub

Carol Winkler

The purpose of this study is to discover the impact of horizontal violence (HV) on nursing students and how it affects their learning. HV is defined as definitive hostile behaviors including gossiping, innuendo, scapegoating, passive-aggressiveness, and bullying (Weinand, 2010). Unfortunately, these behaviors are commonplace in the nursing profession, and they don't specifically target the nursing staff. Student nurses also witness and are victims of HV. Does experiencing HV during a clinical experience serve as a learning barrier to student nurses? Current research primarily focuses on the impact of HV on nurses themselves and not students. HV has been linked to high turnover rates (Armmer & Ball, 2015) and detrimental impacts on patient safety and quality of care (Purpora, Blegen, & Stotts, 2015). This proposed experiment will use Horowitz's Impact of Events Scale to assess the amount of distress experienced by student nurses during their time subjected to HV. Using this scale allows research to be done to determine both trauma and less intense forms of stress, and how much the event is currently bothering the participant.

COLLEGE OF Arts & Sciences

Philosophy

Cold Hearts or Heated Spirits: Hegel, Marx, and Human Freedom

Jacob Foote

Sponsoring Professor

Dr. Alexander Bertland

Over the course of his philosophical career, Karl Marx laid such an importance on the economic components of his materialist conception of history that in his work the role of human agency can seem to be lost. Through a return to Hegel's work, especially in the discussion of the will for self-recognition in the *Phenomenology of Spirit*, a space for subjectivity can be found in a dialectical materialism which observes social evolution not only as the product of material circumstances but also as humankind's own act. Marx's concept of species-being, with its Hegelian attributes, can therefore be defended as a way to conceive of human will, alienation from human existence, and ultimately freedom while maintaining a materialistic philosophical system. The inadequacies of other conceptions of the human person - especially within the materialist worldview - is located in their one-sidedness. Additionally, the significance of Marx's postulate of the human being as a species-being, besides it serving to help refute other understandings of the role people play in history, is in the germ of existentialism it contains that can be seen clearly expressed after Marx by such writers as Jean-Paul Sartre.

COLLEGE OF Arts & Sciences

Political Science

Support for the IRA in Northern Ireland

Oliver Ashe

Sponsoring Professor

Dr. Christopher Lee

Summary: For my project I am going to do the support of the IRA among the population of Northern Ireland based off of income.

COLLEGE OF Arts & Sciences

Political Science

The Economic Transformation of China

Angelo R. Catalano

Sponsoring Professor

Dr. Christopher Lee

In my project I will be discussing two things: HOW and WHY the Communist Party, and more specifically Deng Xiaoping, decided to transform China. For the how I will discuss the policies enacted by the Party that led to rapid economic growth and for the why I will talk about the failed economic policies of Mao Zedong.

COLLEGE OF Arts & Sciences

Political Science

Militia Groups in Africa

Chris Darner

Sponsoring Professor

Dr. Christopher Lee

This research project seeks to learn more about why groups like these exist in Africa. Also, to identify the common goal of these militia groups within society; whether it be power over a population or simply complete abolishment of authority.

COLLEGE OF Arts & Sciences

Political Science

The effect of poverty on recidivism.

Gabriella Decker

Sponsoring Professor

Dr. Christopher Lee

For my research project I plan to find how the rates of recidivism are affected by poverty.

COLLEGE OF Arts & Sciences

Political Science

Abortion Restrictions

Izabella Keetch

Sponsoring Professor

Dr. Christopher Lee

Abortion has been something debated for a long time. New standards are going to be coming into effect putting restrictions on how the process of abortions are being done. Should the government get to dictate what happens to a women's body?

COLLEGE OF Arts & Sciences

Political Science

The Effects of Gentrification on Gangs

Emma Mercurio

Sponsoring Professor

Dr. Christopher Lee

My research project will focus on the role of gentrification, and how it can affect gang life in these urban areas. I will delve into research on gangs and learn about the process of gentrification, and how the two go hand in hand in creating effects on the other.

COLLEGE OF Arts & Sciences

Political Science

Drugs and Poverty

Raven Nelson

Sponsoring Professor

Dr. Christopher Lee

This study illustrates that the drug problem is affecting people from all demographics.

COLLEGE OF Arts & Sciences

Political Science

State repression and voter turnout

William Nowak

Sponsoring Professor

Dr. Christopher Lee

For my project I would like to see if incidents of police brutality or state repression that anger citizens around election times increases voter turnout. In order to do this I will look at the voter turnout data in the location of the incident, before an incident like Mike Brown getting killed, and the data of the election following the incident. The topic would see whether or not the outrage over incidents of state repression increases political efficacy of citizens.

COLLEGE OF Arts & Sciences

Political Science

The effects of climate change on coastal communities

Elijah Restuccio

Sponsoring Professor

Dr. Christopher Lee

A study emphasizing the effects of rising sea levels and changing weather patterns on coastal communities varying in income across the United States.

COLLEGE OF Arts & Sciences

Political Science

People of Color and Rate of Incarceration.

Francesca Reyes

Sponsoring Professor

Dr. Christopher Lee

This project focuses on young kids of color that grow up without a father that end up in the system of incarceration.

COLLEGE OF Arts & Sciences

Political Science

War on drugs

Kevin Rinaldi

Sponsoring Professor

Dr. Christopher Lee

This project will investigate why the war on drugs is failing.

COLLEGE OF Arts & Sciences

Political Science

A Woman's Place Is Saving the World

Michela I. Rossetti

Sponsoring Professor

Dr. Christopher Lee

I will examine the social issues of the world and within states through the perspective of a woman's ability to profoundly correct these issues through her presence in dominant political positions. This will be shown in contexts where it has already happened or is currently happening in state governments worldwide.

COLLEGE OF Arts & Sciences

Political Science

First Ladies and National Health Programs

Cole Sebastianelli

Sponsoring Professor

Dr. Christopher Lee

For my project I plan on doing the section of the political spectrum dealing in national health. Specifically the failures and successes of the national health programs put into place by the many first ladies of our country.

COLLEGE OF Arts & Sciences

Political Science

The Impact of Government Surveillance

Olivia Showers

Sponsoring Professor

Dr. Christopher Lee

In my project I will be speaking about how monitoring by the government effects civilians, and reflect on the pros and cons of the subject.

COLLEGE OF Arts & Sciences

Political Science

Human Rights in China

Nicholas Stoll

Sponsoring Professor

Dr. Christopher Lee

For my research, I want to look at human rights in China. I want to look at what Chinese citizens are allowed to do and what violations the Chinese government enacts on its citizens. I also want to examine whether recent developments in technology and media have somehow curtailed the ability of the Chinese Government to abuse the Human Rights of its citizens.

COLLEGE OF Arts & Sciences

Political Science

Violence in the environmental movement

ShaTeek Trantham

Sponsoring Professor

Dr. Christopher Lee

Summary: This project examines the use of violence by members of the movement, as well as use of violence by state actors. In addition, this study analyzes the role violence plays in movements and what the ramifications of those actions.

COLLEGE OF Arts & Sciences

Political Science

Sharks and the environment

Kylie Tucci

Sponsoring Professor

Dr. Christopher Lee

With the mass destruction of shark populations whether it is from shark finning or by-catch, we must take into consideration how this effects the environment.

COLLEGE OF Arts & Sciences

Political Science

The Benefit of Presidential Travel

Tiernan Callaghan-Mccann

Sponsoring Professor

Dr. David Reilly

This study aims to identify the purposes in which the President of the United States conducts international travel. By comparing the timing of Presidential travel and the approval rating said President holds with the general populous, we can find that there is a direct impact of how the public views their President while he is abroad. This is relevant because it provides a better understanding of the reasons that a President may travel. This paper will be looking at the travel between President Obama and President Trump. By comparing their travel and approval ratings, we are able to identify the impact travel has on approval ratings and the reasons behind those impacts.

COLLEGE OF Arts & Sciences

Political Science

Decentralization in Italy and China

Ethan De Rosa

Sponsoring Professor

Dr. David Reilly

My study compares the Italian industrial district model, gli distretti

COLLEGE OF Arts & Sciences

Political Science

Effects of Income on Education In The U.S.

Joel Gonzalez

Sponsoring Professor

Dr. David Reilly

Do economic conditions in the United States affect education, and do U.S. citizens feel that we are doing enough for our education system? Seeing first hand the devastating effects that poverty has on education, I wanted to research this phenomenon further to understand just how much of a correlation there is between income and education, and how this and the growing levels of income inequality affect citizens view of the education system. Bernie Sanders made recent headlines by stating that, we in the United States have more income and wealth inequality than any other developed nation in the world, as well as the highest child poverty rate of any other developed nation in the world. I look at students level of academic achievement and how much their parents make yearly, and test to see if there is a correlation between the level of household income and level of academic achievement. I hypothesize that, in a comparison of individuals, those with lower annual income and lower levels of education and will then in turn have a lesser view of the education system in the United States. I anticipate that my research will show a positive correlation between respondents yearly income and their level of education achieved. These results can help future legislators and politicians to see how big of a crisis we have in our nation, and how the income achievement and wealth gap is too high and that it is strongly negatively affecting our education system.

COLLEGE OF Arts & Sciences

Political Science

Analysis of Airstrikes by Armed Drones and Manned Aircraft on Civilian Populations

Jason Hake

Sponsoring Professor

Dr. David Reilly

This research project aims to explore the relationship between unmanned, armed, aerial vehicles and the amount of civilian fatalities associated with strikes launched from such machines. Conventional wisdom would suggest that over time, drone strikes would result in less civilian fatalities as the technology becomes more advanced and the operation of drones becomes more refined. The goal of this study is to analyze if this claim holds any merit by examining strikes in the states in which drones have been used.

COLLEGE OF Arts & Sciences

Political Science

The Relationship Between Religious Affiliation and Opinion on The Use of Torture of Suspected Terrorists

Jordan Hartman

Sponsoring Professor

Dr. David Reilly

In the years following the terrorist attacks on the Twin Towers in New York City, terrorism has become a widely discussed issue in the media and among political leaders. The use of torture on those suspected of terrorism is a controversial topic that has been debated as a result of these and other heinous terrorist attacks. My research question is, does one's religious affiliation influence their opinion on the use of torture of suspected terrorists? My hypothesis is that individuals who self-identified as Catholic on the 2012 American National Election Survey are more likely to oppose the use of torture on suspected terrorists than those who did not self-identify as Catholic. The media's portrayal of terrorism makes it imperative for political scientists to study public opinion surrounding this phenomenon because it is important to understand individuals' values on certain issues in order to predict and analyze human values in the future. Religious affiliation may impact public opinion on torture because that is where many develop their sense of morality. It is a common conception that individuals of the Catholic faith tend to be viewed as more "moral" or have certain stances on different issues like punishment and torture. Using statistical tests, I found that those who identify as non-religious were more likely to oppose the use of torture of suspected terrorists than those who identified as Catholic. Further, my research explores the potential alternatives that may impact public opinion of the use of torture on suspected terrorists.

COLLEGE OF Arts & Sciences

Political Science

Opinions on Crime Prevention

Alexandria LaMantia

Sponsoring Professor

Dr. David Reilly

It is important for the government to listen to what the citizens of the country want when it making policies or laws that directly affect the people of the country. The government is made to represent the people in the United States. Knowing this, the country can often be divided when tackling certain issues. There are many divisions in the country, one of these divisions is dealing with race or ethnicity of citizens and how they are treated differently. My presentation and paper asks the question if race could be a predictor for opinion on spending money for crime prevention. This then leads to the question, does race and stereotypes of races play a role when it comes to the government making these policies or laws about crime prevention?

COLLEGE OF Arts & Sciences

Political Science

The "Rise" of China and the future of the International order

Kyle Nielsen

Sponsoring Professor

Dr. David Reilly

Dr. Christopher Lee

Dr. John Stranges

Since the end of the Cold War the United States has been in the unique position of being the international order's dominant superpower. However, the unprecedented and rapid "rise" of China has triggered alarm bells across the globe. China's rapid rise is perceived to threaten the existing status-quo as China strengthens its heightened position in the international order. In this paper I intend to provide insight into the questions: can China displace the United States as the international order's dominant superpower? What is China's vision for the international order? How can the United States respond to the rise of China? I will answer these questions utilizing Power Transition theory which focuses on power and satisfaction within the international order. Specifically, I argue that China is an increasingly dissatisfied state due to its recent military buildup but that traditional measures of power exaggerate the wealth and military capabilities of China as they count China's total resources without deducting the costs it takes to run the state. I further argue that a more accurate indicator of power is measuring power in terms of net resources instead of gross resources by integrating the costs of a nation's population. According to my findings in the coming decades it is likely that China will continue its military build-up, but it will not replace the United States as the international order's dominant superpower. Therefore, U.S. leaders must engage in diplomacy to maintain peace.

COLLEGE OF Arts & Sciences

Political Science

Mandatory Minimums

Morgan Palmer

Sponsoring Professor

Dr. David Reilly

Mandatory minimums have been largely accepted legislation since their conception in the 1980's to reducing crime but, have mandatory minimums had any effect in actually reducing crime? The United States has the highest rate of incarceration in the worl

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Political Science

Protest and Repression

Ipek Saracoglu

Sponsoring Professor

Dr. David Reilly

This paper seeks to investigate whether there is a correlation between protest and repression to support the hypothesis that increased protest activities and other internal legitimacy challenges lead to increased government repression or vice versa. It is not necessary for me to show which one causes the other, I only need to show that either one is causing the other or that there is a correlation between the two in order to support the hypothesis. To do this, I use protest and repression data from the “Mass Mobilization Protest Data” database by Dave Clark and Patrick Regan and the “CIRI Human Rights Data Project”. Using that data, I anticipate that there is indeed a correlation between protests and government repression and that the hypothesis is supported. I use Turkey as a case study to analyze the relationship between protest activity and the government’s response through variables ranging from accommodating the protestors to shootings by the government. I will also use first-hand accounts from myself and other Turkish citizens regarding how protests and repression have affected Turkish citizens’ daily lives. The ramifications of this paper are that, through Turkey as an example, it will help reveal governments’ responses to public dissent and hopefully bring more attention to the case of Turkey and other new democracies.

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Political Science

Public Opinion on illegal immigration to U.S

Elifruveida Uisal

Sponsoring Professor

Dr. David Reilly

Illegal immigration to the United States has dominated American politics for the past years. It caused a debate between political parties in terms of its importance as a problem that needs to be resolved. This research paper evaluates the causes of anti-illegal immigration behavior of American public. Especially, the efficacy of supporting Republican party on opposing undocumented migrants. Besides that, the history of immigration, reforms that influenced the increase of illegal immigration will be covered. As well as the factors that may cause public to demonstrate negative behavior toward immigration. This research will be convenient to understand if political parties really represent the opinion of their voters. I hypothesize that individuals who support Republican party are more likely to oppose illegal immigration to U.S than the individuals who support Democratic party. For the testing I will use the data that was conducted by CBS and Vanity Fair in 2012, as the continuing series of their monthly poll. I anticipate that my research will show a positive correlation between the party identification and opposition to illegal immigration, with the control variable of income level. The results of my testing can help future politicians to have an understanding on the opinions of their voters on illegal immigration.

COLLEGE OF Arts & Sciences

Political Science

Oil's Impact on Country's Regimes Types

Vongsavanh Phengsomphane

Sponsoring Professor

Dr. David Reilly

There are nearly 195 countries in the world with many government types, some more or less democratic than others. What has influenced countries to choose their current regime types? My research question looks at a country's regime type and if a dependence on natural resource(s) has an effect on it. I will be looking at countries who have recently been formed or have found independence from colonial powers since the end of World War II. Specifically I will be studying the dependence on oil from a country and whether or not a country embraces democracy. Broadly speaking countries that are dependent upon natural resources tend to be rentier states and look to foreign investment. These countries that have a dependence on natural resources are less likely to transition into democracies and remain authoritative. Authoritative powers who have control over the natural resources create income and wealth for the populace. Therefore authoritative governments tend to have an incumbency advantage and democratization is less likely. An abundance of natural resources increases competition for control of the state, which is linked to high levels of political violence and the use of resource rents by ruling parties to maintain their hold on political power. By reviewing case studies I have found that countries that produce higher amounts of oil are authoritative.

COLLEGE OF Arts & Sciences

Political Science

Speech Patterns in the U.S Senate

Sadie Newcombe

Sponsoring Professor

Dr. Pimlott

I am interested in looking at how men and women in the Senate use their power of speech.

COLLEGE OF Arts & Sciences

Political Science

State Supreme Court Elections

Emily Wilbur

Sponsoring Professor

Dr. Pimlott

It is believed that the judicial branch is supposed to be insulated from party politics, but at least at the state Supreme Court level, this is often not the case. Judicial accountability, the idea that justices must be responsive to their constituents often overpowers judicial independence. It is clear that judges react to public opinion and party politics and this can be seen through their voting strategies as well as the way in which elections are held.

COLLEGE OF Arts & Sciences

Political Science

The Crime of Mental Illness: A Comprehensive Study of the American Response to Deinstitutionalization

Cheyenne Freely

Sponsoring Professor

Jamie Pimlott

Originally, the American mental health care system was developed to treat and rehabilitate mentally ill patients into functioning as productive members of society. As will become evident in this study, there is little question that the mental health care system in America has failed to fulfill its purpose. Consequently, hundreds of thousands of mentally ill Americans have found themselves entering and exiting through the revolving door of the criminal justice system. Unable to consistently adhere to societal norms and often charged with breaking the law, individuals with serious mental illness are sent to the only other system prepared to handle societal deviance: the criminal justice system. However, the criminal justice system is coercive by nature and has been proven ineffectual at rehabilitation or treatment of anyone, let alone those with mental illness. In fact, the criminal justice system often exacerbates preexisting mental illness. In this study, I analyze the history of the treatment of serious mental illness and policies governing the treatment of the mentally ill, deinstitutionalization, and the rise of the carceral state. Furthermore, by formulating criteria regarding the adequate measures that need to be taken by states to alleviate this issue, multiple states have been graded on their efforts to decriminalize mental illness.

COLLEGE OF Arts & Sciences

Psychology

Gender Differences in Facial Recall

Rebecca Collins

Mara Scive

Sponsoring Professor

Dr. Burt Thompson

Facial recognition memory is an important aspect of our lives and helps us on a daily basis to identify people and make connections between individuals. Studies have suggested that women are better at remembering faces than men, but there are mixed reasons as to why. One explanation is that females are better at processing and reading emotions and this aids them in remembering faces better. However, most of the studies that found these results used faces that were close to the age of participants instead of using a range. In the current study, college students were shown two slideshows of faces containing people in their late teens to early thirties and people in their sixties to early eighties. After the first slideshow participants were given a couple of filler tasks and then shown a second slideshow. In the second slideshow, participants were asked to indicate which faces they thought were on the previous slideshow and which faces they thought were new. The data collected through this experiment is expected to show females recall faces more accurately than males. More specifically, females are expected to demonstrate better recall of the younger faces than the older ones. If this trend does occur, this could imply that while females remember faces better than males, this does not extend to faces that are significantly older than them.

Keywords: facial recognition, memory, gender differences

COLLEGE OF Arts & Sciences

Psychology

The Ethanol Seeking Behavior of Behaviorally Inhibited Goldfish

Brian McGuire

Sponsoring Professor

Dr. Donna Thompson

Dr. Milen L. Radell

Alcohol use disorder is a prevalent problem in modern society. In order to prevent and treat alcohol addiction, it is imperative that we understand the factors that increase the vulnerability for problem alcohol use and help maintain it. In humans, behavioral inhibition is a personality trait that has been associated with increased risk for anxiety, and may contribute to alcohol and other drug use, which is often associated with anxiety and mood disorders. In animal models, behavioral inhibition has been defined as anxiety-like behavior in a novel environment. The current study examined whether there is a relationship between alcohol seeking and behavioral inhibition (BI), using a conditioned place preference paradigm, commonly used in animals to assess preference for previously-rewarded contexts, including that for locations associated with drugs of abuse. Goldfish (n=21) were obtained from a local dealer for the purpose of this study. While the current study did show a significant increase in the preference for an alcohol-paired context following a single exposure to the drug, no significant relationship between BI and preference change was found. Other factors that produce anxiety or anxiety-like behavior, such as stress, have been shown to increase alcohol consumption. Therefore, a future direction will be to examine if there is a relationship between stress and alcohol seeking in goldfish.

COLLEGE OF Arts & Sciences

Psychology

Visual Acuity in Goldfish (*Carassius auratus*)

Brian McGuire

Alexis Schafer

Sponsoring Professor

Dr. Donna Thompson

Dr. Milen Radell

Acuity cards, traditionally used to test visual acuity in human infants, were used to test the visual acuity of calico fantail goldfish and black moors (*Carassius auratus*). Both breeds of fish are descendants of the Prussian carp. Unlike calico fantails, however, black moors have been artificially selected to have large protruding telescopic ocular lenses that, although aesthetically pleasing to humans, may have decreased their visual acuity. Fish ($n=6$) performed a two-alternative forced choice discrimination task, with two different striped patterns simultaneously presented at a constant distance from the outside of the tank. Stimuli, black and white stripes on 11 cm wide sheets of paper, were visible through portholes mounted on the tank wall. Fish were trained to approach and bite the porthole corresponding to the larger stripes in order to receive a food reward. Stimuli varied from 3 cycles/11 cm (0.01 cycles per visual degree) to 55 cycles/11 cm (1.9 cycles per degree). The control stimulus was constant at 123 cycles/11 cm (4 cycles per degree). Fish completed 40-60 trials for each target stimulus. Calico Fantail performance varied across stimuli, with over 90% accuracy at the widest stripes (3 and 4 cycles/11 cm). The smallest striped pattern fish succeeded at was 18 cycles/11 cm (70 to 80% correct). At best, this suggests a visual acuity of 0.6 cycles per degree (approximately 20/1025 on a Snellen chart). In contrast, only one black moor has been able to meet the training criterion.

COLLEGE OF Arts & Sciences

Psychology

First Trial Predicts Overall Performance in Goldfish Visual Discrimination Regardless of Training Difficulty

Brian McGuire

Sponsoring Professor

Dr. Milen Radell

The easy-to-hard effect in perceptual learning shows that training with easier examples can facilitate initially difficult or impossible distinctions between very similar stimuli. This effect has been reported to occur in both humans and other species. In the current study, we tested whether easy-to-hard training could facilitate visual discrimination in common goldfish (*Carassius auratus*). Fish ($n = 6$) performed a two-alternative forced choice discrimination task, which consisted of simultaneously presenting two striped patterns. The stimuli were visible through portholes mounted on the tank wall, with fish required to approach and bite the porthole corresponding to one of the stimuli (i.e., the target stimulus) in order to receive a food reward. The target stimulus remained constant throughout training. Half of the fish were randomly assigned to a training schedule where stimuli became more similar as training progressed. The rest were trained only on the most difficult to distinguish version of the stimuli. Over the course of training, it was observed that there was large variability in performance both between and within individual fish. Thus, we also examined whether performance on the first training trial for a given day was related to overall performance. As expected, performance was found to be significantly higher on days the first trial was correct compared to days on which it was incorrect, but this did not depend on the type of training schedule. In addition, contrary to our hypothesis, fish in the easy-to-hard group did not perform significantly better than those in the constant-hard group.

COLLEGE OF Arts & Sciences

Psychology

Personality and Residence Hall Satisfaction

Sara Vogel

Sponsoring Professor

Dr. Milen Radell

Students who live in different residence halls may exhibit notable differences in personality. These differences could be especially pronounced among upperclassmen, possibly because they have more choice in selecting a residence. Not only does building and room preference appear related to personality (Heilweil, 1973), it has also been linked to student academic performance (Paunonen & Ashton, 2001), retention (Alfert, 1966), and overall satisfaction (Lounsbury, Saudargas, Gibson, & Leong, 2005; Jang & Kim, 2009). The current study examined whether the personality of Niagara University resident students is related to their choice of housing, as well as satisfaction with their living conditions and university experience in general. All resident students were given the opportunity to participate in an online survey to assess these factors. To assess personality, participants completed the Big Five Inventory-2, which taps into the traits of agreeableness, open-mindedness, negative emotionality, conscientiousness, and extraversion (Soto & John, 2017). It is hypothesized that students who score higher on the trait of extraversion will be more likely to live in more populated buildings, and that those who were able to receive their first choice in residence will report greater satisfaction. The results will provide valuable information regarding choice and quality of residence on campus, as well as their relationship to satisfaction and academic success. The study may also have broader relevance, to the extent that Niagara University students are representative of the larger population of college students at other academic institutions.

COLLEGE OF Arts & Sciences

Psychology

Adult Age Differences in Attitudes about Organ Donation

Jamie Hagerty

Sponsoring Professor

Dr. Susan E. Mason

Due to organ donations being a controversial topic in modern medicine, a survey was given to a range of age groups to determine the motivations and barriers to becoming an organ donor. Surprisingly, it seems that older age groups are more likely to be willing to donate their organs. This could be explained by younger ages not feeling obligated to prepare for their death, and what they want to leave for the world after their gone.

COLLEGE OF Arts & Sciences

Psychology

Adult Age Differences in Attitudes about Chiropractic Care

Kayla Kolacz

Jamie Hagerty

Sponsoring Professor

Dr. Susan E. Mason

The value of chiropractic care is misunderstood by many older adults, though its effectiveness has been demonstrated for all ages. Administering a questionnaire developed by Jimerson (2018), we tested adult age differences in attitudes about chiropractic care. Experience proved to be a more important factor than age. If a person was previously treated, they were more willing to go back, found it more effective, were more trusting, and had a better overall understanding of chiropractic care.

COLLEGE OF Arts & Sciences

Psychology

College Alcohol Beliefs and Drinking Consequences: A Conditional Process Analysis

Lauren Hearn

Sponsoring Professor

Dr. Timothy Osberg

Entering freshmen completed measures of college alcohol beliefs (CABs), social engagement, pregaming frequency, and weekly drinking and drinking consequences in three waves (start of semester, one month in, and three months later; W1-W3). A conditional process analysis (Hayes, 2018) revealed that the effect of CABs (W1) on drinking consequences (W3) was serially mediated by pregaming frequency (W2) and weekly drinking (W3). The strength of this serial mediation was moderated by participants' social engagement scores (W2).

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Psychology

Predicting Freshman Drinking Consequences: A Study of Student and Parent Alcohol Beliefs

Anna Mundy

Jaclyn Foulis

Sponsoring Professor

Dr. Timothy Osberg

In a prospective study, incoming college students' beliefs about the role of alcohol in college life (college alcohol beliefs; CABs) were assessed along with perceived parental CABs, and drinking norms (descriptive and injunctive) as predictors of drinking and drinking consequences. Perceived parental CABs were strongly associated with students' CABs. Hierarchical regression analyses revealed that, after accounting for perceived parental CABs, descriptive norms, and injunctive norms, students' CABs accounted for significant additional variance in drinking outcomes.

COLLEGE OF Arts & Sciences

Public Health

Where the Youth Are in Charge

Samone Carr
Kiara Santiago
MacKenna Bluett

Sponsoring Professor

Dr. Deborah A. Leonard

Bringing health and protection to Niagara Falls is the goal of our social marketing program. We propose creating a program for youth (who are enrolled or not enrolled in school) to decrease the violence within the community and promote youth support. "Where the Youth Are in Charge" (WYAC) will inform youth and parents throughout the community about our program. We are also attempting to target city and government officials who could potentially fund our project including the Board of Education. One in every 280 persons falls victim to a violent crime so by reducing the number of crimes we increase the safety throughout the city. The WYAC will provide more opportunities to youth by creating summer jobs and promoting fitness activities and increasing their health and wellness. This will help with financial support within households and participating students will benefit with improved cognitive development, reduced isolation, and fewer mental health problems such as depression. The WYAC will create a fun safe environment for all with year round programs. The project opens doors to a variety of new opportunities and shine lights on new objectives within the community of Niagara Falls.

COLLEGE OF Arts & Sciences

Public Health

A Proposed Intervention to Decrease Obesity in Niagara Falls

Karsen Cotten
Aubrey DeVeau
Emily Johnston

Sponsoring Professor

Dr. Deborah A. Leonard

Our social marketing plan was designed to decrease obesity in Niagara Falls, NY. The target audience is the community in which the Heart, Love and Soul soup kitchen is located. Our social marketing plan is designed with the characteristics of the community in mind. We have identified the factors that influence the obesity rates; such as the amount of exercise people are getting and why they are getting this much, as well as any other health issues they have that keeps them from getting the recommended amount of exercise. We have created an education program for the community on ways to get more exercise and how to overcome barriers. This is an important problem to intervene in because obesity may be the cause of some of the other health issues people in this community are facing. We will present data on the relationships between the obesity rates and the other health problems that are also being faced in this community.

COLLEGE OF Arts & Sciences

Public Health

A Proposed Intervention to Decrease Litter and Create Job Opportunities in the Niagara Falls Community

Elizabeth DiCarlo

Emily Westfall

Matthew Vogt

Sponsoring Professor

Dr. Deborah A. Leonard

Our social marketing plan was designed to decrease the overall amount of litter in Niagara Falls, NY. In addition, this plan will create job opportunities for the unemployed. The target audience is the community soup kitchen located in downtown Niagara Falls, and anyone else in the area that can benefit from the proposed program. Our social marketing program has taken into account the characteristics of the community, highlighting the factors that influence littering and unemployment. Our program will educate the community on the adverse health and environmental effects of littering, and suggest ways to reduce litter to improve the quality of health in the community of Niagara Falls. Information about the health and environmental effects of littering and the issue of unemployment in the community will also be presented.

COLLEGE OF Arts & Sciences

Public Health

Improving Home Environments within Niagara Falls

Zoe Gavin
Meghan Lippa
Nina Dilella

Sponsoring Professor

Dr. Deborah A. Leonard

The goal of this social marketing campaign is to help impoverished tenants learn do-it-yourself tricks in order to decrease the health hazards often found in substandard housing. The target audience of the campaign is the northern Niagara Falls community served by the Heart, Love and Soul soup kitchen and food pantry. The specific targeted population is individuals, families with children, and seniors who are living in substandard housing. The barriers to creating a safe and healthy living environment lies in the knowledge of what constitutes a health hazard and the household's ability to financially correct such problems. The information pamphlets distributed will describe and educate the tenants on the significance of the problems as they relate to short- and long-term health outcomes. Included will be an array of quick, easy and cheap remedies for the hazards that can be fixed without major costly interventions. This campaign will be implemented by providing the information in public places that are easily accessed and often frequented. To evaluate the success of the program, assessments will take place after a period of time to compare the original housing conditions to the current condition.

COLLEGE OF Arts & Sciences

Public Health

Intervention for Increasing the use of Public Transportation In Niagara Falls

Caroline Leitch
Cameron Maris
Hailey Bicknell

Sponsoring Professor
Dr. Deborah A. Leonard

Our social marketing plan was designed to increase the use of public transportation in Niagara Falls, NY. The target audience is the nearby community around Heart, Love, and Soul. The bus stations are located throughout Niagara Falls, and this is the area we have targeted for our social marketing project. Our social marketing project considered the transportation utilization statistics, flaws in the system and how to better them, and maintaining the safety and cleanliness of all modes of public transportation. The benefits of public transportation are presented in detail, as well as resources on transportation, and the different types of transportation available.

COLLEGE OF Arts & Sciences

Public Health

Combating Gum Disease and Improving Dental Hygiene in Niagara Falls

Charles Richards

Nicholas Robel

Megan Cunningham

Sponsoring Professor

Dr. Deborah A. Leonard

Dental hygiene is an important aspect to living a healthy life. When faced with tough life situations like the community served by Heart, Love and Soul, one tends to make sacrifices to certain aspects of life such as maintaining dental health. Our social marketing plan is designed to improve dental hygiene and decrease the occurrence of issues such as gum disease and gingivitis in the target population. By understanding the characteristics and needs of the community we were able to understand the factors related to dental health decay. Information is also presented relating poor dental hygiene to further adverse health effects. This data will be used to educate about the importance of proper dental hygiene as well as provide access to essentials related to dental health.

COLLEGE OF Arts & Sciences

Public Health

Implementation of the Backpack Program in Summer Camps to Combat Food Insecurity: A Pilot Project

Riley Meechan

Sponsoring Professor

Dr. Mark Gallo

Hunger is a problem faced by millions of people worldwide, each and every day. In Western New York alone, nearly 20 percent of children are food insecure-- they do not have enough food or food of adequate nutritional value for all members of the household to support a healthy lifestyle. Food insecurity leads to physical challenges, as well as difficulty with cognitive processes. To combat this, a number of schools in the Western New York area have implemented the Backpack Program in conjunction with Foodlink, a local food resource center. Children are able to take home a backpack filled with food that fits with the United States Department of Agriculture's nutritional guidelines. This has helped many families in the region during the school year, but the summer still remains a source of uncertainty.

The present project proposes the implementation of the Backpack Program at local summer camps in order to serve more of the population during these months. A pilot program will be set up at Camp Piperwood, in Rochester, New York, which already serves a number of these food insecure families. For those are not receiving this additional support, an emphasis on nutrition education will be placed on camp activities, such as the weekly cookout.

In order to understand the full scope of the project's effect, a short survey will be conducted at the end of the summer to see if it has made a difference in the overall hunger level, mood, and physical feeling of the child.

COLLEGE OF Arts & Sciences

Public Health

Invasive Plant Removal and Native Plant Conservation at Niagara University

Cassidy Okon

Sponsoring Professor

Dr. Mark Gallo

Invasive species are organisms that cause ecological damage, environmental harm, and can even negatively impact human health by taking over environments that they are not native to. These species have a tendency to cause the extinction of native species by becoming predators and outcompeting any other species in that habitat. Our old growth forest on campus is suffering from invasions of these species such as buckthorn, garlic mustard, and honeysuckle. By restoring the native plants and eradicating the invasives, we will be increasing the biodiversity of the forest along with creating a healthier ecosystem for the native fauna.

COLLEGE OF Arts & Sciences

Public Health

Narcan/Naloxone

Margaret Smith

Sponsoring Professor

Dr. Mark Gallo

This study was completed to study the general knowledge of Narcan/Naloxone and its benefits in society. A survey was given to individuals who have been through Narcan Training and to individuals who have not been through the training. The results were compared to see how knowledgeable the individuals were on the topic of Narcan, how it works, as well as their opinions on its benefits in society. Ultimately, this study should show that Narcan training benefits society by bringing awareness and knowledge to the public.

COLLEGE OF Arts & Sciences

Religious Studies

Tolkien's '*Leaf by Niggle*': A Christian Reflection on the Eternal Value of Work

Mikayla Fulton

Sponsoring Professor

Dr. Robert St. Hilaire

Catholic author J.R.R. Tolkien describes a theology of work in a creative and innovative way in his short story '*Leaf by Niggle*'. A theology of work is the study of work from the Christian perspective. In the Christian tradition, work is described as an action that reflects the worker while at the same time connecting him or her both to others and God. This thought was created and developed in the Protestant tradition by the thinkers Martin Luther and John Calvin.

COLLEGE OF Arts & Sciences

Science

Niagara University Science Undergraduate Research Fellowship Program

Brendan DeCoff

Sponsoring Professor

Dr. Christopher Stoj

The Niagara University Undergraduate Research Fellow program (NU-SURF) allows selected students, majoring in the chemistry, biochemistry, and biology, the opportunity to have unique and in-depth research experiences with NU professors. Goals of the program included preparing students for their education after Niagara by building strong leadership skills, providing dedicated first-year student/faculty mentorship, and developing extensive research skills with the students research advisor. The purpose of this poster is to chronicle my experiences as a first year research fellow. As a part of my first year, under the guidance of Dr. Stoj, I conducted an in-depth chemical investigation on the topic of vaping, looking further into how the chemicals contained in e-juice interact with the body, and how various devices are used to deliver such chemicals. Additionally, I worked with Dr. Gallo, Dr. Marnocha, and Dr. Glazier for a research rotation period of three weeks each. The first rotation was with Dr. Gallo where I worked on his bacteriophage project, isolating phage from old samples and spotting them to determine their effectiveness. During the second rotation with Dr. Marnocha I worked on testing the effect of pH on sulfur cycling bacteria attaching to sulfur globules. During the third and final rotation with Dr. Glazier I worked to isolate *Candida albicans* from old growth oak trees. My experiences during these guided research experiences allowed me to become more familiar with each of the professors laboratories, enabling me to make an informed decision on which professor to select as a long-term research advisor.

COLLEGE OF Arts & Sciences

Social Work

Adolescent Mental Health

Cierra Axton
Jamie Guadagno

Sponsoring Professor
Dr. Rolanda Ward

The Rose Bente Lee Ostapenko Center for Race, Equality, and Mission has partnered with Mount St. Mary's hospital to conduct research on adolescent mental health needs in Niagara County. We are conducting research on agencies that are already in place, as well as exploring possible barriers as to why adolescents cannot access the services they need. With our research, Mount St. Mary's Hospital will use that data to help create more services so that all adolescents in Niagara Falls can receive the mental health services they need and deserve.

COLLEGE OF Arts & Sciences

Social Work

Youth Educational Advocacy: Perceptions of Race and Equality Issues in Schools

Kaylyn Townsend

Sponsoring Professor

Dr. Rolanda Ward

The Rose Bente Lee Ostapenko Center for Race, Equality and Mission hosted a Youth conference on April 10, 2019 where 175 middle and high school students were in attendance. Youth from Western New York attended workshops presented by undergraduate and graduate students from Niagara University and various Western New York colleges. Our purpose for this conference was to address local and national issues of race through a youth lens. Our goal was to encourage youth to engage in dialogue about race and equality issues in their schools and communities. Our research aimed to identify if a one day conference impacts youth and their chaperones understanding and awareness of race-related issues. We also aimed to understand if a one day conference influenced youths perceptions of their ability to act on social justice or race-related issues in their schools and communities. In addition, we also aimed to study if chaperones were more optimistic about youth's ability to advocate for social justice issues in their schools. Findings from this project will be used to implement high-school based interventions in our region.

COLLEGE OF Business

Finance

Operational Risk in the Financial Services Industry

Emma Lindke

Sponsoring Professor

Edward Hutton

Dr. Ann Rensel

Dr. Petter Lovaas

From 1998 to 2018, there have been substantial concerns and risk factors that financial institutions have focused on in their annual reports. In my report, I examine the historical development of the top 13 largest banks in the United States with over \$250 billion in assets, according to the latest numbers from S&P Global Market Intelligence. I study their annual reports through the past 20 years and examine their risk management section and determine what has changed throughout this time. A large measure of financial institutions risk problems start with technology. Technology has expanded tremendously over the last 20 years and has impacted banks both positively and negatively. Some financial institutions have experienced breaches, and in this paper, I analyze the risks of cybersecurity attacks and breaches that have occurred and how the Basel III Accords are strengthening and regulating these risks in the banking sector.

COLLEGE OF Business

Marketing

Breaking The Bond Between Country Music And The Radio

Zackary Kephart

Sponsoring Professor

Dr. Paul Richardson

Dr. Peggy Choong

Dr. Carrie Teresa

The main purpose of this study is to look at evolving business practices in the country music industry. Ever since its inception as a commercial music genre in 1922, country music owes its growth to radio airplay. Even today, to artists and professionals within the industry, radio is the gatekeeper deciding which artists will and won't have successful recording careers. However, over this past decade, artists have debunked this theory by utilizing alternative forms of marketing, promotions and channels to have their music heard by the public (and, subsequently, reach their target demographic). This thesis explores the idea of alternative channels for country artists to have their music heard and what value it holds for consumers and the industry in general. This study seeks to examine the scholarly impact of radio on country music's history and to explore whether it is, in fact, the key driver for success in the country music industry today. Additionally, this study seeks to provide country music's history and relationship with the radio format and digital landscape over the past 20 years. This study will utilize data collected from artists who don't receive regular airplay to show how artists can sustain a thriving career without the help of country radio. Lastly, this study intends to further explore ways in which artists can market themselves through all of the available channels they have in the modern day.

COLLEGE OF Education

Early Child & Child Education Birth-6

A comparative study of 10-year-old girls' experiences of educational systems in Germany, South Korea, Finland, Ghana and India

Marie Gruszczynski

Sponsoring Professor

Dr. Mary Ellen Bardsley

Across the world, the daily experiences of girls differ greatly. As young girls go about their daily routine of going to school, they experience adversity in their learning experiences. This paper analyzes and explains the lives of young girls from 5 different countries: Germany, South Korea, Finland, Ghana and India. The primary focus of the analysis is what 10-year-old girls experience in regard to their education. The girls in the study are fictional but their experiences are based on data, research and testimonials of real girls from the countries. The research for this study used a variety of databases and online journals. This paper will be supplemented by a children's book which illustrates the girls' daily routines of going to school.

COLLEGE OF Education

Early Child & Child Education Birth-6

Maslow's Hierarchy of Needs for English Language Learners

Kalie Sonnenberg

Sponsoring Professor
Dr. Mary Ellen Bardsley

In the 21st century, the population of students living within the United States and attending school has greatly evolved. There has been immense rise in the amount of English Language Learners (ELLs) within the educational system. In turn, this has led to a diverse and different population of students being taught in comparison to 20 years ago. This differentiation within the school system has led to evolving needs for the students that must be met in order for students to succeed academically. The purpose of this thesis is to provide a better understanding of Maslow and his hierarchy while simultaneously establishing a deep connection and a conceptual understanding of English Language Learners' needs within an academic setting. This paper analyzes and explains the history of English Language Learners in the context of the United States education system. The primary focus of this analysis is the creation of a case study illustrating the struggles of an ELL student and her teacher. The research used for this study was conducted using a variety of databases and online journals. Through this thesis, I demonstrate the needs of English Language Learners that must be met in order for the students to succeed.

COLLEGE OF Education

Early Child & Child Education 1-6

Recess and it's Benefits: Teacher's Perspectives- From Theory to Practice

Megan Ciotuszynski

Sponsoring Professor

Dr. Robin Erwin

The study sought to discover teachers perceptions about recess. The objectives were to determine how much time teachers allocated to research each day, teachers beliefs about recess, and how teachers prioritized their school day. A questionnaire was sent out to teachers in two rural school districts. The questionnaire was double sided and asked the teacher's questions related to the research objectives. The research results determined that many teachers recognize the benefits of recess in theory, but not in practice. Almost half of the teachers admitted that their students got less than an hour of recess each week. The teachers prioritized Math and English because the students have a high-stakes test in those disciplines. Even though many considered recess valuable, they did not incorporate it daily. Based on the findings of this study, I would recommend that more research be done on ways to support teachers in adding recess into their school day. One option may be a mandatory recess period. This would alleviate the stress teacher's face to fit recess in the day, and it would stop recess from being withheld as a punishment. Another recommendation is to do more research on recess in different seasons. This study was done in the winter, so the amount of time students got for recess might have been different if teachers were able to take their students outside. More research and advocacy is needed to help people see all the benefits of keeping recess in schools.

COLLEGE OF Education

Math Education 1-9

Women in Mathematics

Kathryn Liotta

Sponsoring Professor

Dr. Maritza Branker

Dr. Amanda Mangum

Dr. Paul Vermette

My thesis will focus on modern women who have distinguished themselves in the field of mathematics. Specifically, I will be researching women who have earned their doctorates and are established mathematical scholars. In order to find established scholars, I will research women from the top universities ranked internationally as well as women who are active in committees for women in mathematics, such as AWM.

I will research into their specific fields of mathematics and provide information on their specific research areas. Overall, I seek to produce a compilation of profiles of women who have an important presence in the field of mathematics. Each profile will provide background information on how the scholar established herself in the field of mathematics in addition to the notable work she has completed in her field. I will comment on how societal factors have led to these women succeeding in the highest tiers of mathematical research and academia based on the research I have conducted.

COLLEGE OF Education

Math Education 7-12

Gamifying Math Instruction

Jacquelyn Maass

Sponsoring Professor

Dr. Maritza Branker

Dr. Dennis Garland

This study combines personal research with the research of others to demonstrate the effect gamified math activities have on the students' comprehension and motivation. Gamification is the use of game elements in non-traditional contexts. Previously used in other fields like marketing, gamification is just now making its way in to education. It is relatively new instructional approach to keep students engaged. This study focuses on the effectiveness of gamification as well as a way teachers could practically implement this technique in their own classrooms.