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# Celebration 2019 Abstract Booklet

Xavier University - Cincinnati

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# Celebration of Student Research and Creative Activity

April 25-26, 2019

*Sponsored by the College of Arts and  
Sciences, Office of Undergraduate Research, and March Gladness*

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On behalf of the College of Arts and Sciences and the Office of Undergraduate Research, we'd like to welcome you to the 25<sup>th</sup> Anniversary of the Celebration of Student Research and Creative Activity. Funding for the Celebration was generated through the March Gladness campaign. During this annual fundraising event, undergraduate research received the fourth largest number of donations from students, friends and alumni of the University. This annual occurrence gives concrete evidence of the value of undergraduate research as foundational preparation for the career pathways of our graduates, regardless of whether or not they end up in the same discipline.

Thinking about foundations, a 25th Anniversary provides a great opportunity for looking back at the foundations upon which this annual event has been built. From its humble beginnings as an afternoon event organized by Max Keck, Dean of the College of Arts and Sciences in the spring of 1995 to the two-day event with research awards and keynote speakers we observe today, there are four people being honored during this event who have made undergraduate research at Xavier what it is today.

Dr. Janice Walker, serving as Dean of the College of Arts and Sciences created the Office of Undergraduate Research, while heavily supporting the expansion of undergraduate research to non-science disciplines during her tenure.

Dr. Barbara Hopkins, Xavier's first Director of Undergraduate Research, continues to be a tireless advocate for undergraduate research in her role as Chair of the Chemistry Department and research advisor to countless undergraduate research students.

Suzanne Chouteau, from the Department of Art, has served extensively as mentor, advisor, and NCUR trip chaperone. Her excellent work with students is a major reason that "Creative Activity" is in the title of the Celebration, as undergraduate research is extended beyond the science laboratory and into the art studio.

Marca Kasselmann, administrative assistant to the Departments of Chemistry and Physics, has spent a career organizing research lunches and symposia, taking pictures of research students, compiling, printing and assembling abstract books, and providing caring and loving support to research students. Though much of her work was behind the scenes, without it, the Celebration of Student Research an events like these would not be possible.

To the students whose work presented today represents a foundation upon which your future will be built, let's take a moment to recognize those that have built undergraduate research into the signature experience of a Xavier education. The work of those mentioned above and so many not mentioned has allowed Xavier to be a model for how to best provide research experiences to undergraduate students. Alumni supporters of the University have provided funding that has opened up opportunities for more, and more substantial, participation in research for students. And faculty research mentors have provided the patient teaching, advising, and guidance that is central to the undergraduate research experience. Congratulations to both students and faculty for the work being showcased during this Celebration.

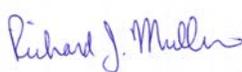
Sincerely,

Dr. David Mengel



Dean, College of Arts and Sciences

Dr. Richard Mullins



Director, Office of Undergraduate Research

## **KEYNOTE SPEAKER**

### **Sarah Jablonski Schandle, PhD**

Sarah Jablonski Schandle, PhD, graduated from Xavier University in 2006 with a Bachelors in Psychology. Sarah earned a Masters Degree in Experimental Psychology at Saint Joseph's University and a Doctorate in Behavioral Neuroscience from the University of Delaware. Sarah later worked as a postdoctoral fellow in the Division of Neurology at Cincinnati Children's Hospital. Her doctoral and postdoctoral pre-clinical research focuses on the causes and prevention of long-term neurological and cognitive impairments following prenatal exposure to neurotoxic agents. She has authored or co-authored 20 peer-reviewed manuscripts, including original research, review articles, and book chapters. Sarah is the recipient of multiple research fellowships and awards, including a National Institutes of Health (NIH) research grant, and a post-doctoral fellow research award. Sarah currently works as a scientific director for a medical communications company that helps pharmaceutical and biotechnology companies improve healthcare professionals' and the public's understanding of their products, and increase patient access to the latest advancements in science and medicine.

## **UNDERGRADUATE RESEARCH AWARD RECIPIENT**

### **Julia Schlich**

Julia Schlich is a senior from north of Boston, Massachusetts. Julia studies Health Services with a concentration in Information Management, and Business minor. In her third year, she began research with Dr. Eileen Alexander, as part of a Quality Management and Performance Improvement community service learning course. In January 2018, she began work with teammate Christina Driskell and HSA Partner, the TriHealth Cancer Institute, under Karen Huelsman, a genetic counselor. Her quality improvement projects decreased process times, and improved data integrity, helping to ensure that all patients whose genetic testing results reveal a predisposition to cancer are seen by a genetic counselor in a timely manner. After graduating, Julia plans to pursue a Health Services career in Chicago.

### **Christina Driskell**

Christina Driskell is a senior Health Services Administration major with a concentration in Information Management and Business minor. In her junior year, Christina began the community service learning section of Quality Management with Dr. Eileen Alexander. After learning about quality improvement tools and team science, she and Julia Schlich began work with TriHealth genetic counselors on a project to create clinical genetic databases. Dr. Alexander's Quality, Community Service internships and independent study courses prepared her for high level research using real patient data. Some genetic variants affect how the cancer responds to treatment, and some can be inherited by their children. This partnership deeply impacted the lives of patients, and their families, by helping clinicians to assess their data in real time, provide evidence-based care and counseling to their families. Christina will be moving to California after graduation to pursue her career in health quality analytics.

## **UNDERGRADUATE RESEARCH MENTOR OF THE YEAR (URMY)**

### **Eileen Steinle Alexander, PhD, MS, BSN, RN**

In 2014, Dr. Eileen Steinle Alexander came to Xavier to teach in Health Services Administration. In 2015, she developed the new Community Service Learning (CSL) series for undergraduates, and the MS in Health Economic & Clinical Outcomes Research (HECOR) degree, supporting the need for graduate & online degrees in health analytics. As an NIH T-32 Fellow in Epidemiology of Children's Environmental Health at the University of Cincinnati, College of Medicine, her research focused on population health, with emphasis on family and twin gene-environment risk models in eosinophilic esophagitis. Her publications include twin modeling, pathology scale development, population stratification bias, diversity recruitment, and artificial intelligence systems.

A former hospital RN, and Operating Room Educator, she was a certified Infection Preventionist with Quality and Risk Management through 4 successful Joint Commission inspections.

Now focused on creating a faculty-student research ecosystem at Xavier, "Dr. A" teaches Quality Management, CSL Internship, Independent Studies in Advanced Health Services, Epidemiology, Introductory HECOR, Ethical Health Informatics and Research, and Global Health Systems. To improve U.S. health indicators, which lag behind comparable developed countries, her students support "local-global" healthcare

service sites. She serves as the faculty advisor for the Institute for Healthcare Improvement Club and UPD Honor Society. To improve health education, she speaks on high impact teaching methods, including CSL. On a personal note, she serves on the medical team for the Cincinnati Flying Pig marathon, the Indian Hill Village Green Areas Advisory Committee, which sustains over 3000 acres, and as Chair-elect of the Ethics Faculty Forum for the Association of University Programs in Health Administration.

As a first generation college graduate, Dr. A understands the challenges unfamiliarity breeds. As role model, she believes in iterative improvement and practice. Since 2015, over 80 students have completed the CSL courses, 27 have participated in Independent Study, 15 presented at Celebration of Research, 3 co-authored peer-reviewed publications or grants, and they have repeatedly won the department's "Inspirer" and "Leader" awards. Many, many have represented Xavier locally, regionally and nationally as "women and men for others."

### **MARCH GLADNESS SUMMER RESEARCH FELLOWS**

Over the course of two days in March, hundreds of students, alumni, professors, staff members, and friends of the University came together to show their support for undergraduate research at Xavier through participation in the March Gladness fundraising campaign. Attracting the fourth largest number of donations on campus, undergraduate research received nearly \$10,000. These funds are going directly back to students through the funding of the Celebration of Student Research and Creative Activity, partial support of student travel to meetings, the funding of the Xavier Undergraduate Research Award, and the support of two March Gladness Summer Research Fellows. The recipients of this year's March Gladness Summer Research Fellowships are Mary Cianciolo and Michael Nichols

**Mary Cianciolo**, a resident of Troy, Michigan, is a Public Relations and Political Communication student. Her research proposal this summer involves building a dataset of demographic characteristics and political experience of local counselors in Ireland in order to assess the impact of Gender Quotas on the recruitment and election of women to local offices. Mary will also be serving as a legislative intern in the Gene Beaupre State Politics Internship program in Columbus, Ohio this coming summer.

**Michael Nichols**, a resident of Cincinnati, is a Biology Major with Minors in Classical Humanities and Chemistry. He enjoys his major as it has allowed him to explore the unique concentrations within the broader biology category including Botany, Human Physiology, and Comparative Anatomy. After graduation from Xavier University, Michael hopes to pursue a medical career with a focus in Orthopedics. Outside of class, he is involved in intramural sports, Athletes in Action, volunteer work at Bethesda North Hospital, and Alternative Breaks. His research this summer simulating mechanisms of plant communication will contribute to an international collaboration between Xavier University and the University of South Wales.

## ART

Sheridan Davenport	<a href="#"><u>A JOURNEY THROUGH A BLACK WOMAN PRAXIS</u></a>
Mary Elizabeth DeWitt	<a href="#"><u>GO TO COLLEGE, GET GOOD GRADES, GRADUATE: A GROWING DEBT CRISIS</u></a>
Daniel Zalla	<a href="#"><u>REIMAGINING THE GOOD MALE ROLE MODEL</u></a>
Alice Roeding	<a href="#"><u>STRANGERS, STRENGTH, AND BURDEN</u></a>
Jensen Healey	<a href="#"><u>WHAT IS A MONSTER</u></a>

## BIOLOGY

Erica Geers	<a href="#"><u>ASSESSING OPTIMAL LURE DOSAGE FOR TRAPPING OF VELVET LONGHORNED BEETLE, TRICHOFERUS CAMPESTRIS (FALDERMANN)</u></a>
Alexander Little	<a href="#"><u>EFFECTIVENESS OF WATER TEMPERATURE ON MAGGOT (DIPTERA: CALLIPHORIDAE) MORTALITY</u></a>
Samantha Estes	<a href="#"><u>PERSISTENCE OF METAHIZIUM BRUNNEUM MICROSCLEROTIA UNDER FOREST CONDITIONS</u></a>
Julia Lenhof, Anne Debbane, Nathan Lomelin, Alder Villegas	<a href="#"><u>SEASONAL VARIATION IN THE AQUATIC MACROINVERTEBRATE COMMUNITY WITHIN CINCINNATI'S MILL CREEK WATERSHED</u></a>
Kelsey Tobin	<a href="#"><u>DOES FLUOROPOLYMER PREPARATION EFFECT CAPTURE OF LONGHORN BEETLES IN PANEL INTERCEPT TRAPS</u></a>

## CHEMISTRY

Hannah Lankswert, Haden Maloney	<a href="#"><u>EFFORTS TOWARD THE TOTAL SYNTHESIS OF BOTH ENANTIOMERS OF PILOSININE</u></a>
Jamaad Reed	<a href="#"><u>ANALYZING TRIPHENYL TIN CHLORIDE USING HIGH PERFORMANCE LIQUID CHROMATOGRAPHY BASED ON A NIOSH-SANCTIONED METHOD</u></a>
Christopher Utrup, Aaron Moore	<a href="#"><u>SYNTHESIS OF CHLORO-OXIME LIGANDS AND THEIR TRANSITION- METAL COMPLEXES</u></a>
Jessica Loving	<a href="#"><u>PROFILING THE EXPRESSION OF METASTASIS GENES IN TASMANIAN DEVIL FACIAL TUMOR DISEASE</u></a>
Nicholas Ellerhorst	<a href="#"><u>INVESTIGATION OF FLOW PATTERN IN SERPENTINE MICRO-CHANNEL DESIGNS</u></a>
Winnifrida Nzobigeza	<a href="#"><u>PAPER BASED ASSAY OF COPPER ION USING AN EGG WHITE AS A NATURAL REAGENT</u></a>
Patrick Meccia	<a href="#"><u>ANALYSIS OF MONOBUTYLIN CHLORIDE (MBT) BY HIGH PERFORMANCE LIQUID CHROMATOGRAPHY</u></a>

Mackenzie Turner [EFFECTS OF A HUMANIZED ANTI-COCAINE MONOCLONAL FAB FRAGMENT ON THE URINARY EXCRETION OF COCAINE AND METABOLITES](#)

Kennedy  
Borchardt, Bailey  
Perkins [EFFORTS TOWARDS THE SYNTHESIS OF \(+\)-KALKITOXIN](#)

Jennifer Shannon,  
Zach Rohr [OPTIMIZATION OF CLOUD POINT EXTRACTION OF HEAVY METALS AND QUANTIFICATION THROUGH ELECTROANALYTICAL METHODS](#)

Bethany Taylor.  
Rachel Krevh [STUDIES OF THE OXIDATIVE MECHANISM OF THE COPEPR AMINE OXIDASES](#)

### CLASSICS AND PHILOSOPHY HONORS BACHELOR OF ARTS

Viktoria  
Schumacher [COMPARING ANCIENT TO MDOERN: HOW ANCIENT GREECE AND ROME PROVIDE INSIGHT FOR US CITIZENSHIPS AND IMMIGRATION IN THE 21<sup>ST</sup> CENTURY](#)

Ryan Spolar [DEOM RAMBO TO RETURN: HOW ROMAN VETERANS WERE TREATED](#)

Caroline Blandford [GENRE'S IMPACT ON WITCHES IN ROMAN LITERATURE](#)

Yan Idrissov [GOVERNING THE HUMAN ANIMAL: AN EXAMINATION OF PLATONIC POLITICAL PHILOSOPHY THROUGH PETER SLOTERDIJK'S ACCOUNT OF THE LUXURIOUS ANIMAL](#)

Emma Barlow ["I SEE" SAID THE BLIND MAN; "I KNOW" SAID OEDIPUS](#)

Nicholas Tarnowski [MANNING UP WITH THE TIMES: HOW THE CONCEPT OF 'VIRTUS' SHIFTED AMONG ANCIENT ROMAN AUTHORS](#)

Ty Richer [REASSESSING CAUSES AND FINDING SIMILARITIES BETWEEN THE NIKA AND ANTIOCH RIOTS](#)

Morgan Doty [THE REVOLUTIONARY GALEN: GALEN AND HIS LEGACY AS A TURNING POINT IN ANCIENT MEDICINE](#)

Stephen Bothwell [THE TRANSACTIONS OF MORTAL COIL: HELLENIC MEANING IN THE SUFFERING OF THE ILIAD AND THE ORESTEIA](#)

### ECONOMICS

Rachel McFadden [LEISURE TIME ALLOCATION BY WAGE AND EDUCATIONAL LEVEL](#)

Lucy Schroder [THE ROLE OF A NATIONAL ENTERPRISE IN REDUCING FOOD WASTE](#)

### HEALTH SERVICES ADMINISTRATION

Brooke Conkle,  
Molly Kidwell [ASSESSING 30-DAY READMISSION RATES OF PATIENTS WITH CHRONIC OBSTRUCTIVE PULMONARY DISEASE](#)

Emily Helton,  
Saharish Ijaz

[GHANAIAN HOSPITAL SANITARY TOILET FACILITIES AND POPULATION HEALTH: KORLE-BU- TEACHING-HOSPITAL'S \(KBTH\) ACCRA, GHANA](#)

Julia Schlich,  
Christina Driskell,  
Kendall King,  
Colleen Moore

[XAVIER BS-HAS STUDENTS SUPPORT POPULATION HEALTH: CREATING A GENETIC DATABASE FOR TRIHEALTH CANCER INSTITUTE](#)

## [HISTORY](#)

Mackenzie  
Ferguson

[A DIM FUTURE: THE DARK HISTORY OF THALIDOMIDE AND ITS CHANGING CONTRIBUTION TO THE WORLD](#)

Grace Longmuir

[CELEBRATING 50 YEARS OF WOMEN AT XAVIER](#)

Alex Ackerman

[FROM WARREN COUNTY TO FLINT, MICHIGAN: THE ENVIRONMENTAL JUSTICE MOVEMENT](#)

Laura Walker

[JEHOVAH'S WITNESSES AND BLOOD TRANSFUSIONS: ETHICAL AND LEGAL IMPLICATIONS](#)

Kaitlyn Roach,  
Gabriella Scolio

[UNDERSTANDING THE IMPACT OF THE FEDERATION OF COLORED WOMEN'S CLUBS: LEARNING AND CELEBRATING BLACK WOMEN IN CINCINNATI](#)

## [MANAGEMENT](#)

Zachary Dutro

[INFAMOUS EVENTS, FIRM RESPONSE, AND THE IMPLICATIONS FOR FIRM REPUTATION](#)

Libby Grace

[RESTORATIVE BEHAVIOR IN ORGANIZATIONS: A REVIEW AND PROPOSED MODEL](#)

Madeline Teed

[WILL ORPHAN DRUG ACTS HELP OR HURT INCUMBENTS?](#)

## [MATHEMATICS](#)

Mackenzie Vernon

[RESERVING EFFICIENCY](#)

Jun Bum Cho

[THE AVERCH-JOHNSON EFFECT ON THE FIRM BASED ON ITS INDUSTRY AND PRICE FOR CAPITAL AND LABOR](#)

## [PHILOSOPHY, POLITICS, AND THE PUBLIC](#)

Matthew Miller

[THE PROBLEM OF CONGRESSIONAL REPRESENTATION](#)

Shannon  
Cunningham

[AN AMERICAN EXPECTATION FOR UNIVERSAL HEALTH CARE](#)

Lily Hutkowski

[RIGHTS AND RESPONSIBILITIES IN THE PUBLIC SPHERE](#)

Ethan Alter

[ELECTORAL SURPLUS: ANALYSIS OF OHIO](#)

Colin Lang	<a href="#"><u>IN OUR OWN BEST INTEREST: A CLOSE STUDY OF THE FEDERALIST PAPERS AND THE ROLE OF SELF- INTEREST IN OUR REPUBLIC</u></a>
Patrick Rohs	<a href="#"><u>THE UNITED STATES AND ITS ADMINISTRATIVE GOVERNMENT</u></a>
Rafael Luciano	<a href="#"><u>THEORY, CROWDSOURCING, AND THE FUTURE OF PUBLIC POLICY</u></a>
Brianna Ledsome	<a href="#"><u>WHY HOPE VI ISN'T SO HOPEFUL: CONCENTRATIONS OF POVERTY IN AMERICA'S INNER CITIES</u></a>

## [PHYSICS](#)

Anthony Plochocki	<a href="#"><u>CRANIAL IMAGE GUIDED ALIGNMENT ACCURACY AS A FUNCTION OF ANATOMICAL LOCATION</u></a>
Emily Shockley, Lillian Haerr	<a href="#"><u>EXPLORING THE EFFECTS OF SINGLE POINT MUTATIONS OF ARABIDOPSIS THALIANA CRYPTOCHROME 1 (AT CRY1), A PLANT PROTEIN INVOLVED IN BLUE LIGHT RESPONSE</u></a>
Alex Nahas, Ryan Caliguri	<a href="#"><u>HEAT LOSS UTILIZATION</u></a>
Eduardo Rivera Nicholls	<a href="#"><u>GOLF BALL SIMULATION AND AERODYNAMIC CHARACTERISTICS</u></a>
Andrew Gundersen, Enrique Hernandez, Ryne Quinlan	<a href="#"><u>NOP</u></a>
John Sternen, John Paul Kavanagh	<a href="#"><u>PROBING CONFORMATIONAL CHANGE IN CRYPTOCHROME VIA PHOSPHORYLATION</u></a>
Riley Williams	<a href="#"><u>EXPLORING HOW PROTEINS TUMBLE IN A SET ENVIRONMENT</u></a>

## [POLITICAL SCIENCE](#)

Zachary Arriaga	<a href="#"><u>CHINESE PUBLIC OPINION ON THE US: INVESTIGATING THE ROLE OF POWER PERCEPTION IN US-SINO RELATIONS</u></a>
Megan Eckerman	<a href="#"><u>COMPARING KIDS</u></a>
Noah Ruffin	<a href="#"><u>CONGRESSIONAL RELIGIOUS AFFILIATION AND ENVIRONMENTAL POLICY</u></a>
Eleanor Bjurman	<a href="#"><u>DOES THE UNITED STATES ASYLUM PROCESS NEED TO BE REVISED COMPARED TO ITS GLOBAL COUNTERPARTS?</u></a>
Kaitlyn Clyne	<a href="#"><u>GENDER PRESENTATION AND RHETORIC IN DEBATES</u></a>
Grant Regan	<a href="#"><u>GENTRIFICATION AND PROPERTY RIGHTS</u></a>
Charles Quinn	<a href="#"><u>POLITICIANS TWITTER RESPONSE TO MASS SHOOTINGS</u></a>

Heather Gast [PRESIDENTIAL VOTE AND ATTITUDES TOWARD ABORTION, 1980-2016](#)

Christopher Harding [SUSTAINING THE AMERICAN DREAM](#)

Samuel Green-Lauber [THE 2016 'INVINCIBLE PRIMARY'](#)

Aidan Shea [THE FIGHT FOR 15: THE MINIMUM WAGE QUESTION](#)

Colin Cooper [THE ONGOING IMPACT OF 9/11](#)

Samuel Green-Lauber [THE PARTY DECIDES OR DOES IT?](#)

Joseph Ortiz [THE RESTAURANT CLEANLINESS EFFECT ON DEMOGRAPHICS](#)

Kayla Curtin [WHY DO PEOPLE AGREE OR DISAGREE WITH ABORTION](#)

## [PSYCHOLOGY](#)

Tyeshia Smith [DOES THE RACE OF AN AGGRESSOR AND VICTIM AFFECT THE PERCEIVED FAIRNESS AND ACCEPTABILITY PUNISHMENT FOR TRANSGRESSIONS](#)

Katherine Pfeifer [DOES TYPE OF ABUSE AFFECT PERCEPTIONS OF A PERPETRATOR'S GENDER](#)

Alyanna Reick-Mitrisin [EFFECTS OF DISCLOSURES ABOUT INVISIBLE DISABILITIES ON INTERPERSONAL STIGMATIZATION](#)

Paige Hubbard [EFFECTS OF POLITICIANS GENDER AND APOLOGIES ON PERCEPTIONS OF SCANDAL](#)

Emily Tenkman [EFFECTS OF WARNING LABELS ON EDITED PHOTOS POSTED ON INSTAGRAM: IMPACTS ON FEMALES SELF-ESTEEN, SELF-WORTH, AND APPEARANCE-RELATED SATISFACTION](#)

Molly Radcliff [HUMAN-ANIMAL INTERACTION REDUCES STRESS AND INCREASES POSITIVE MOOD](#)

Jaclyn Fahey [LIKELIHOOD OF FORGIVENESS FOLLOWING A TRANSGRESSION WITH OR WITHOUT A SINCERE APOLOGY](#)

Sara Rojas [PERCEIVED CREDIBILITY OF FEMALE SPORTS BROADCASTERS IN MALE AND FEMALE SPORTS](#)

Victoria Pezzino [PERCEIVED SIMILARITY OF AUTISM AS A FACTOR AFFECTING STIGMA](#)

Julia Rodriguez,  
Michelle Rowekamp, Gemma Sutkiewicz, Jackie Fahey [PERCEPTIONS OF ATHLETES LEADERSHIP](#)

Nikki Giesel [TAKING THE PERSPECTIVE OF A STUDENT WITH ANXIETY](#)

Taylor Luhr [HOW LABELS AFFECT PERCEPTIONS OF PEOPLE WITH VISIBLE OR NON-VISIBLE INTELLECTUAL DISABILITIES](#)

Nicholas Martinez	<a href="#"><u>PRE-VERSUS POST-LEARNING STRESS ON MEMORY</u></a>
Taylor Wilkinson	<a href="#"><u>SOCIAL AND MORAL ACCEPTABILITY OF TAKING ANOTHER STUDENT'S ADHD MEDICATION DURING URGENT AND NON-URGENT ACADEMICALLY IMPACTFUL SITUATIONS</u></a>
Kimberly Ziegenhorn	<a href="#"><u>SOCIAL INCLUSION OF AMERICAN AND JAPANESE INTROVERTS IN EXTROVERTED SOCIAL SITUATIONS</u></a>
Riley Varney	<a href="#"><u>STUDENTS' PERCEPTIONS OF GPA AND PERSONALITY IN HIRING DECISIONS</u></a>
Michelle Rowekamp	<a href="#"><u>TECHNIQUES TO IMPROVE SUPERVISOR- EMPLOYEE RELATIONSHIPS</u></a>
Caroline Stepchuk	<a href="#"><u>THE DISNEY PRINCESS INFLUENCES ON BODY SATISFACTION IN YOUNG ADULTS</u></a>
Julia Fabrizi	<a href="#"><u>THE EFFECT OF KNOWLEDGE ON STIGMA AND BLAME OF MENTAL ILLNESS</u></a>
Azl Saeed	<a href="#"><u>THE EFFECT OF MORAL RELATIVISM ON DISCOUNTING THE MORALITY OF INGROUPS AND OUTGROUPS</u></a>
Sarah LeMay	<a href="#"><u>THE EFFECT OF PRIMED AFFECT ON AGE STEREOTYPES</u></a>
Ryan Watson	<a href="#"><u>EFFECT OF SELF AND PARENTAL EXPECTATIONS ON PERCEPTIONS OF NON MEDICAL PRESCRIPTION STIMULANT</u></a>
Adrian Perez	<a href="#"><u>THE EFFECT OF SOCIAL INCLUSION AND SELF AWARENESS ON SELF-ESTEEM</u></a>
Jessica Kidd	<a href="#"><u>THE EFFECT OF SPECTATOR TYPE ON PERCEPTIONS OF AN ATHLETE'S PERFORMANCE</u></a>
Maggie McDonnell	<a href="#"><u>THE EFFECT OF CONFRONTING DISPARAGING METAPHORS ABOUT WOMEN ON POLITICAL CORRECTNESS AND SEXISM</u></a>
Ana Hernandez	<a href="#"><u>THE EFFECTS OF EXPERIENCING SUCCESSFUL OR UNSUCCESSFUL EVENTS ALONE OR WITH OTHERS ON INDIVIDUALS' SENSE OF BELONGING</u></a>
Benmun Damul	<a href="#"><u>THE EFFECTS OF PROFESSORS RACE AND ACCENT ON COLLEGE STUDENTS PERCEPTIONS OF PROFESSORS COMPETENCY</u></a>
Lily Taplin	<a href="#"><u>THE EFFECTS OF SUSPECT RACE AND MENTAL ILLNESS HISTORY ON THE PERCEIVED ACCEPTANCE OF AND SUPPORT FOR POLICE USE OF FORCE AND OVERALL TRUST IN POLICE</u></a>
Christopher Steele	<a href="#"><u>THE INFLUENCE OF VERBAL AGGRESSION AND INTIMATION ON AN ARGUMENTS PERSUASIVENESS</u></a>
Mitch Murphy	<a href="#"><u>THE RELATIONSHIP BETWEEN SOCIAL APPROVAL AND SEXUAL HARASSMENT</u></a>
 <b><u>THEOLOGY</u></b>	
Tianna Vozar	<a href="#"><u>A BROAD VIEW OF STRUCTURAL RACISM AND ITS CONTRIBUTION TO MASS INCARCERATION IN THE UNITED STATES</u></a>

**A JOURNEY THROUGH A BLACK WOMAN PRAXIS**

Sheridan Davenport (Ms. Suzanne Chouteau)  
Department of Art

For many people, the first thing they notice about me is the color of my skin—a result of the reality in which we exist. Although having black or brown skin has notoriously been deemed inferior, I have found that it is a source of empowerment for me as a Black-American Woman today. Through graphic design and printmaking, “A Journey through a Black Woman’s Praxis” allowed me to express what I have learned from those in the past and how I’ve applied my personal understanding of my blackness throughout my life. My journey began with the consideration of past topics that still pertain to my life now, such as W.E.B. DuBois’s double consciousness and how black people are portrayed throughout history or the lack thereof. My work tells of a mix between the psychedelic feel of the 70s and the iconic sense of empowerment I experience in black America today. If becoming a woman has taught me anything, it is that if I want something, I must go out and get it, but never be too prideful to ask for help, return the favor, and give thanks to God. “A Journey through a Black Woman’s Praxis” is a representation of my essence and a reminder that no matter who you are, you are meant to be a part of our world’s history, specifically art history.

**GO TO COLLEGE, GET GOOD GRADES, GRADUATE: A GROWING DEBT CRISIS**

Mary Elizabeth DeWitt (Ms. Suzanne Chouteau)  
Department of Art

This series explores the complex challenges of college students in today’s technological, social media driven world. Students are plagued with higher anxiety and depression rates than at any other time in history—a known fact due to the increase of medications prescribed. They are expected to outperform peers at school to compete in an ever-increasingly tight job market. The notion that they must go to college and graduate with great grades, however, is an idea thrust upon them without the power that it once held. A college education with a high GPA isn't a guarantee of anything, except perhaps more anxiety and depression. Social expectations across the spectrum of personal, academic, and professional are unintentionally killing some college students. The goal of the series is to examine these problems while offering a positive visual path forward.

**REIMAGINING THE GOOD MALE ROLE MODEL**

Daniel Zalla (Ms. Suzanne Chouteau)  
Department of Art

My series of three reduction woodcuts explores the ideal male role model. The inspiration for this series arose from a reflection on the climate of our current culture. The media has recently revealed an apparent drought of morals among men in the United States. As the idea of “toxic masculinity” has been projected onto men in general, I have found it hard to gather encouragement to strive for greater success or take on ambitious goals. This consideration drove me to look at the people in my own life where I did not recognize any of this toxic masculinity. Through the creation of these works of art, I attempt to explore the different characteristics in these role models that I hope to emulate in my own life.

**STRANGERS, STRENGTH, AND BURDEN**

Alice Roeding (Ms. Suzanne Chouteau)  
Department of Art

*Strangers, Strength, and Burden* is a series of three hand-stenciled and photo emulsion screen-prints stylistically inspired by American printmaker Corita Kent. Kent was a nun and art teacher during the mid-20<sup>th</sup> century during which she used her religious upbringing and passion for social justice to create politically charged work regarding subjects such as poverty and racism. Drawing from Kent’s use of color, dynamic fonts, and pop culture references, *Strangers, Strength, and Burden* honor three great African-American individuals who have upheld Kent’s values of acceptance and love throughout history. This historically inspired series of screen-prints echoes the ideals of the Jesuit liberal arts education including cross-disciplinary work, a linking of faith and justice, and a concern for the oppressed. While the work reflects on artists and figures from the past, it also calls the viewer to question if and how these ideals and quotes are manifested in the modern political climate. *Strangers, Strength, and Burden* connects past, present, and future to inspire a world that Corita Kent would be proud to live in.

## **WHAT IS A MONSTER**

Jensen Healey (Ms. Suzanne Chouteau)  
Department of Art

My project, titled “Askesis” is an ongoing photographic exploration of contemporary asceticism documenting the daily lives of those living within ascetic traditions. Askesis is the Greek word from which we get the English word “Asceticism.” It originally referred to the exercise or training a warrior does to strengthen her/his body. Breaking down the body gives it the chance to grow stronger. Contemporary asceticism can be understood in a similar manner: Rather than understanding the phenomena of asceticism as the process of shunning an external world, ascetics live in a way designed to fully engage with impactful aspects of their life, excluding action unrelated to mystical or salvific importance. My project is related to, and continuing the work of, Sebastiao Salgado’s recent photographic series “Genesis.” The social documentary photographer’s project saw a shift in emphasis away from the raw portrayal of the harms stemming from global industry and greed towards an attempt to portray the parts of our earth which are untouched by it. As such, Salgado’s work is a rejection of human social weaknesses. He finds an answer to injustices present in his previous work by asserting the importance of connecting to nature on a global scale. “Genesis” provides the imagery for beginning to disassemble the narrative of unfettered global consumption. “Askesis” provides a working method for the continuation of this idea by attempting to portray the compelling aspects of simplicity, mindfulness, and a search for mystical truth in contrast to narratives present in consumerist cultures.

## BIOLOGY

### **ASSESSING OPTIMAL LURE DOSAGE FOR TRAPPING OF VELVET LONGHORNED BEETLE, TRICHOFERUS CAMPESTRIS (FALDERMANN)**

Erica Geers (Dr. Ann Ray)  
Department of Biology

The velvet longhorned beetle (VLB; *Trichoferus campestris* [Faldermann]) has recently emerged as a potential pest in North America. VLB is a polyphagous wood-borer that targets healthy or slightly stressed trees of more than 40 genera (FERA 2015). Recently, a sex-aggregation pheromone—trichoferone—has been isolated and shown to be effective in trapping *T. campestris* (Ray et al. 2019). This present study is part of a larger study that tested several pheromone concentrations and lure designs to determine the most efficient lure. The results presented here are from the Ohio location. Traps were hung for a total of four weeks and were collected and examined weekly for VLB. A total of eight beetles were found. This can be explained by the low VLB population density in Ohio. However, all of the beetles were found in trichoferone-baited traps, demonstrating the pheromone’s potency, and most of the beetles were found in the 3mg/day release, showing that this concentration—and not a higher concentration—is sufficient. Our results will help pest survey programs optimize trapping protocols for VLB, allowing for a quick response to prevent VLB from establishing in other areas.

### **EFFECTIVENESS OF WATER TEMPERATURE ON MAGGOT (DIPTERA: CALLIPHORIDAE) MORTALITY**

Alexander Little (Dr. Mollie McIntosh)  
Department of Biology

Myiasis refers to the infestation of insect larvae in tissue. Infestation of fly larvae, or maggots (Diptera: Calliphoridae) can be common in humans (e.g., open wounds, bedridden patients) and animals (e.g., wildlife, strays), especially in cases of neglect. Adult flies will lay eggs on necrotic tissue which can then become a food source for the developing larval stages. Many different solutions (e.g., chloroform, isopropyl alcohol, Dakin’s solution) have been used to treat myiasis, however, there is no standardized protocol. Water temperature has not been tested for its efficacy of killing maggots. As a result, the main objective of this study was to determine the relationship between maggot mortality and water temperature. Third instar maggots were utilized in two experiments: (1) that involved single temperature treatments of water at either 0°C, 22°C, 49°C, or 100°C and (2) that involved dual temperature shock treatments of either switching from 49°C to 0°C water for 2.5 minutes each or switching from 0°C to 49°C water for 2.5 minutes each. All experiments had total exposure times of five minutes. After each exposure, maggot mortality was determined. Maggots that survived were exposed to their same respective treatment until death occurred or the maggot group experienced five total exposures. For the single temperature treatments, third instars exposed to 100°C water experienced a mean mortality of 100% after just one exposure. While third instars exposed to single temperature treatments of 0°C, 22°C, and 49°C, all had zero mortality after all exposures. The dual

temperature shock treatment switching from 49°C to 0°C water had a mean mortality of 8% after three exposures; whereas switching from 0°C to 49°C water had zero mortality after all exposures. While boiling water has a large effect on maggot mortality, this is not a feasible treatment for patients. Our data suggests submerging wounds in water below temperatures of 49°C for a single temperature treatment would not be effective in treating myiasis. Dual temperature shock treatments from 49°C to 0°C water had slight mortality (8%), but this would not be effective in the treatment of myiasis. Further investigation into dual temperature shock treatments with higher replication is necessary.

### **PERSISTENCE OF METARHIZIUM BRUNNEUM MICROSCLEROTIA UNDER FOREST CONDITIONS**

Samantha Estes (Dr. Ann Ray)  
Department of Biology

The Asian Longhorned Beetle (ALB; *Anoplophora glabripennis* [Motschulsky]; Coleoptera: Cerambycidae: Lamiinae), is a polyphagous, arboreal pest native to East Asia (Hajek 2007). ALB was likely introduced to the United States via solid wood packing material and if left unmanaged, could be responsible for the deaths of up to 30% of all trees in North American hardwood forests (Hu *et al.* 2009). Entomopathogenic fungi show promise for insect pest management. Specifically, *Metarhizium brunneum* [Petch] strain F52 (Hypocreales: Clavicipitaceae) can infect and kill ALB. Because it has minimal non-target effects, *M. brunneum* is an alternative to synthetic pesticides currently employed to control infestations of ALB. For the present study, we tested the effect of dose and formulation on the ability of conidia (spore-forming structures) to infect ALB. Further experimentation was conducted at Cornell University to determine the persistence and efficacy of the fungus under forest conditions over time to optimize timing of application and microsclerotia concentration needed for control of ALB populations in the field.

### **SEASONAL VARIATION IN THE AQUATIC MACROINVERTEBRATE COMMUNITY WITHIN CINCINNATI'S MILL CREEK WATERSHED**

Julia Lenhof, Anne Debbane, Nathan Lomelin, Alder Villegas (Dr. Mollie McIntosh)  
Department of Biology

The Mill Creek Watershed (MCW) is an urbanized stream system that runs through the greater Cincinnati region of Southwestern Ohio. Historically, this watershed has become degraded due to human activities including: industrial pollution, combined sewage overflows, and channelization. While restoration efforts have been made in sections of the MCW, baseline data is still needed to better understand the current situation of the entire watershed and how this might vary overtime. The main objective of this study was to assess differences in macroinvertebrate community structure and function between the summer and fall seasons. We predicted that the total macroinvertebrate density and functional feeding group composition would vary overtime, however diversity would not. Macroinvertebrate stream samples, both riffle (n=3) and composite habitat (n=1), were collected from four sites within the MCW in both July and October of 2018. The data from both months were compared to determine seasonal changes in the macroinvertebrate population. We observed an increase in mean density from summer to fall, with high variation observed in diversity and functional group across sites. This study provides baseline data on seasonal changes that may influence the macroinvertebrate community inhabiting the MCW.

### **DOES FLUOROPOLYMER PREPARATION EFFECT CAPTURE OF LONGHORN BEETLES IN PANEL INTERCEPT TRAPS**

Kelsey Tobin (Dr. Ann Ray)  
Department of Biology

Insect traps are used to collect, monitor and control native and exotic pests. Black panel intercept traps treated with a water-based brush-on fluoropolymer suspension (Fluon®) are standard for monitoring longhorned wood-boring beetles (Coleoptera: Cerambycidae). The typical brush-on application method is costly and generates waste of Fluon®. The present experiment investigates the effect of different methods for applying Fluon® on capture of longhorn beetles in cross-vane panel traps. Fluon® treatments included water-based brush-on versus an aerosol spray-on application. Five two-trap replicates were arranged in East Fork State Park (Clermont Co., OH.), each baited with a generic attractant lure, and collected weekly. Number of longhorned beetles in each trap were recorded. Our results have implication for improving trap design and minimizing cost.

## CHEMISTRY

### **EFFORTS TOWARD THE TOTAL SYNTHESIS OF BOTH ENANTIOMERS OF PILOSININE**

Hannah Lankswert, Haden Maloney (Dr. Richard Mullins)  
Department of Chemistry

Pilosinine and pilocarpine are two of several alkaloids which can be extracted from *Pilocarpus jaborandi*, a plant native to the West Indies. Pilocarpine has medicinal implications in the treatment of glaucoma, while pilosinine's biological activity remains to be explored. The proposed synthesis for (+)- and (-)-pilosinine incorporates conjugate addition to the same intermediate in one stereodivergent step to set each stereocenter. Addition to the intermediate under conditions with allyltributyltin and zirconium (IV) chloride yields one enantiomer intermediate, while treatment of the same intermediate with allylmagnesium bromide and CuBr·DMS yields the other enantiomer intermediate. Previously, conditions have been optimized for this stereodivergent step in the synthesis of (+)-pilosinine; current efforts intend to optimize conditions for the stereodivergent step in the synthesis of (-)-pilosinine.

### **ANALYZING TRIPHENYLTIN CHLORIDE USING HIGH PERFORMANCE LIQUID CHROMATOGRAPHY BASED ON A NIOSH-SANCTIONED METHOD**

Jamaad Reed (Dr. Barbara Hopkins)  
Department of Chemistry

The purpose of this research project is to validate the NIOSH-sanctioned method to analyze triphenyltin chloride (TPT) using high performance liquid chromatography (HPLC) following the NIOSH criteria for developing an analytical method. TPT is used as stabilizers in antifouling paints, biocides, fungicides, insect and rodent repellants, and as molluscicides. However the use of TPT has detrimental effects on the environment. Workers exposed to TPT are at risk to adverse health effects from skin irritation to increased risk of cancer. Therefore OSHA, the Occupational Safety and Health Administration, has implanted Permissible Exposure Limits (PEL) for organotin. A mobile phase made of 78% methanol, 16% deionized water, 6% acetic acid, and 0.04% tropolone. A wavelength of 386 nm was used. NIOSH requires that the instrument can determine linearly the compounds between 0.1xPEL and 2xPEL. Solutions in this range were made and analyzed using the HPLC. Data using both the peak area and peak height was analyzed. Peak height showed stronger linearity. Glass filters were also spiked with TPT to determine the ability of the method to recover it from the filters and to test the stability of the compound when filters were stored for a maximum of four weeks. When six filters were spiked at 1xPEL and stored for 2 weeks, an average recovery of 79.5% was found.

### **SYNTHESIS OF CHLORO-OXIME LIGANDS AND THEIR TRANSITION-METAL COMPLEXES**

Christopher Utrup, Aaron Moore (Dr. Craig M. Davis)  
Department of Chemistry

Ligands with oxime functional groups are noted for their ability to stabilize normally inaccessible oxidation states such as Ni(III) or Cu(III). Previous work in our research group includes the synthesis of two novel tris-oxime ligands, TRIPHOX and TRITOX, as well as the synthesis and X-ray structural characterization of the [Ni(TRIPHOX)Cl<sub>2</sub>] complex. The ligands within this project are the building blocks for TRIPHOX and TRITOX. These building blocks consist of 2-chloroacetophenone oxime (Cl-PHOXIME) and 1-chloro-3,3-dimethyl-2-butanone oxime (Cl-TOXIME), respectively. The syntheses of the ligands Cl-PHOXIME and Cl-TOXIME will be observed. In addition, the syntheses of TRIPHOX and TRITOX with first row transition-metal complexes will also be explored. Furthermore, there will be a possible alternative method of TRIPHOX synthesis to be explored. The ligands and their metal complexes will be characterized through <sup>1</sup>H-NMR spectroscopy, and the metal complexes will also be characterized by UV-vis spectroscopy and magnetic-susceptibility measurements.

## **PROFILING THE EXPRESSION OF METASTASIS GENES IN TASMANIAN DEVIL FACIAL TUMOR DISEASE**

Jessica Loving (Dr. Imelda McGonnell, Tammy Shadbolt, Dr. Hopkins)  
Department of Chemistry

Transmissible tumors propagate through direct transfer of cancer cells between individuals that are able to escape an immune response from their host. Tasmanian Devil Facial Tumour Disease (DFTD) is one of two naturally occurring mammalian transmissible cancers, causing 100% mortality. It is transferred by biting, mating, and feeding has caused the population of Devils to decline rapidly and they are now an endangered species. The tumor typically forms around the neck and face, then within 6 months the devil will die. Causes of death includes: starvation, asphyxiation, secondary infection or organ failure by metastasis. We further studied the manifestations of metastasis that leads to the death of the affected Devils. We studied the metastasis through identifying expression of genes associated with epithelial to mesenchymal transition (EMT) and cell migration. Using PCR and gel electrophoresis, we were able to identify genes that possess migratory potential in 4 different DFTD cell lines. These genes may be useful targets for therapy to prevent metastasis in DFTD which would reduce mortality from this disease.

## **INVESTIGATION OF FLOW PATTERN IN SERPENTINE MICRO-CHANNEL DESIGNS**

Nicholas Ellerhorst (Dr. Supaporn Kradtap-Hartwell)  
Department of Chemistry

Microfluidics is the use of a pattern of micro-channel network for chemical analysis and these models are engraved on a solid substrate, PMMA in this case. Micro-fluidic systems are used for scaling down chemical analysis which allows for small chemical consumption and less waste production. One of the most popular designs of the micro-channel is serpentine or a winding channel in which it allows a long channel to fit within a short space of a micro-fluidic unit. The objectives of this research are 1) to create the micro-fluidic designs with a laser engraver and 2) to test the flow pattern of liquids in the serpentine designs. The key parameters of the laser engraver are the speed and the power set up. They can be controlled based on materials being engraved and alter the depth into the surface of the substrate. The width and depth of the channel can be measured by the Stylus Surface Profiler. The micro-channel pattern is enclosed by a blank PMMA cover plate which is held tight by double sided tape. Inlet/outlet ports can be created by inserting plastic tubing in the holes that are drilled through the cover plate. Epoxy glue is used to seal around the port to prevent leaking. In order to test the efficiency of the designs, food colorings are run through. This allows visual observation, through a microscope camera, of the flow pattern and signifies how well the liquids stay separate or mix. Parameters such as flow rate, inlet angle, depth and length of channel are investigated how they affect the flow pattern.

## **PAPER BASED ASSAY OF COPPER ION USING AN EGG WHITE AS A NATURAL REAGENT**

Winnifrida Nzobigeza (Dr. Supaporn Kradtap Hartwell)  
Department of Chemistry

Simple and affordable ways to design and create paper-based devices using easy to find materials and equipment have been explored. Aspects of green analytical chemistry are also incorporated into this research by making use of natural reagents in chemical analysis. Filter paper was selected as a paper substrate. The design of hydrophobic and hydrophilic regions was created using sticker. Waxy materials such as petroleum jelly, candles, and crayons were tested for their feasibilities in producing hydrophobic barriers. Egg white and copper ions were selected as model natural reagent and analyte to demonstrate the performance of the developed simple paper based device. Colorimetric determination of copper ions was carried out through digital image analysis of RGB values. The paper based device should be useful for field analysis as well as for low cost teaching tool.

## **ANALYSIS OF MONOBUTYLIN CHLORIDE (MBT) BY HIGH PERFORMANCE LIQUID CHROMATOGRAPHY**

Patrick Meccia (Dr. Barbara M. Hopkins)  
Department of Chemistry

Organotin compounds are a hazard in the workplace. The National Institute for Occupational Safety and Health (NIOSH) requires a simple and user-friendly method for detecting butylorganotin compounds. Current methods of detection for these compounds are more complicated and not all laboratory settings have access to the proper instrumentation. Developing a method using High Performance Liquid Chromatography

(HPLC) to detect butylorganotin compounds in the air in accordance with NIOSH standards would be an improved approach. The purpose of this project is to develop an air sampling method for the organotin compound, Monobutyltin Chloride (MBT) that satisfies the criteria of NIOSH. The wavelength of maximum absorbance to be used for detection by the HPLC has been determined to be 382 nm and solutions within a range of 0.1 to 1 x the Permissible Exposure Limit (PEL) for this compound have shown a linear response using both peak height and peak area. When filters were spiked at concentrations of 0.5 and 1.0 x PEL, the average recoveries for these concentrations fell within the NIOSH accepted range of 75-125 % recovery. A stability study which is currently being performed has shown that the compound is stable on the filters up to three weeks.

### **EFFECTS OF A HUMANIZED ANTI-COCAINE MONOCLONAL FAB FRAGMENT ON THE URINARY EXCRETION OF COCAINE AND METABOLITES**

Mackenzie Turner, Jordan Marckel, Tiffany Bell-Horwath, Hanna Wetzel, Eric Chan, Andrew Norman (Dr. Hanna Wetzel)  
Department of Chemistry

Cocaine abuse, addiction, and dependence are major threats to world health. Currently, there are no approved medications for cocaine abuse. The anti-cocaine monoclonal antibody h2E2 prevents cocaine from crossing the blood-brain barrier by sequestering it in the plasma. h2E2 will enter clinical trials in 2019. Studies have suggested that the purified Fab binding portion of h2E2 might mimic the sequestering ability of h2E2. The Fab fragment clears faster and accelerates the urinary clearance of cocaine; therefore, it may be a favorable candidate for clinical treatment of cocaine use disorders. Since cocaine and cocaine metabolite concentrations in the urine are used as a measure of efficacy in clinical trials, the effects of the Fab fragment on the urinary profile of cocaine was investigated. 11 adult male rats were individually placed in metabolic cages. A baseline urine output was established, collecting every 3 hours for 24 hours. Fab fragment (83 mg/kg) or vehicle was infused intravenously. One hour post-infusion, an equimolar dose of cocaine HCl (0.56 mg/kg) was injected. Urine was collected every 3 hours for 24 hours. Food and water intake were measured and unaffected by either treatment. Creatinine excretion levels in urine were quantified and unchanged by the treatments. Fab caused a two-fold increase in urinary clearance of cocaine, as measured by LC-MS. In conclusion, the Fab fragment alters the metabolism and excretion of cocaine in rats, indicating that the Fab fragment may be beneficial for treating cocaine overdose or toxicity.

### **EFFORTS TOWARDS THE SYNTHESIS OF (+)-KALKITOXIN**

Kennedy Borchardt, Bailey Perkins (Dr. Richard Mullins)  
Department of Chemistry

Kalkitoxin, a lipopeptide derived from the cyanobacterium family *Lyngbya majuscula*, displays antiproliferative properties in a biological setting. Its cytotoxic properties have been observed in ocean life and are also expanded to rat neurons and human colon cancer cell lines. The cancer-fighting implications have sparked efforts towards the synthesis of (+)-kalkitoxin, which can potentially be used to cease the production of ATP by the electron transport chain in cancer cells. These efforts to create an efficient, stereoselective process for the synthesis of the aliphatic core of kalkitoxin by use of asymmetric 1,4-conjugate addition reactions will be presented.

### **OPTIMIZATION OF CLOUD POINT EXTRACTION OF HEAVY METALS AND QUANTIFICATION THROUGH ELECTROANALYTICAL METHODS**

Jennifer Shannon, Zach Rohr (Dr. Adam Bange)  
Department of Chemistry

The inspiration of our research is due to the fact that exposure to heavy metals is common in several occupations, such as welding, construction, battery production, and others. Thus, it is important to develop a technique in order to detect whether or not heavy metals poisoning is a risk relevant to factories and areas. This technique must be adequately sensitive and accurate, as well as cost and time efficient. While there is a current method to do this, it takes large sample sizes and requires expensive techniques for analysis. We are investigating ways that Cloud Point Extraction can be optimized to serve as an efficient extraction technique. This particular technique is already well-established for the separation of pre-concentrated hydrophobic species from water in the form of micelles, but the overall yield and robustness of technique must be improved. Currently, we are focusing on determining the optimum concentration of Dithizone that is used as

the chelating agent. Ultimately, the goal is to optimize CPE in order for it to be paired with voltammetry to analyze low concentrations of heavy metals.

### **STUDIES OF THE OXIDATIVE MECHANISM OF THE COPEPR AMINE OXIDASES**

Bethany Taylor, Rachel Krevh (Dr. Stephen Mills)  
Department of Chemistry

Copper Amine Oxidases (CAOs) are a family of enzymes that catalyze the conversion of primary amines to aldehydes and ammonium, while at the same time reducing  $O_2$  to  $H_2O_2$ . These enzymes are found in many different organisms such as bacteria, fungi, plants, and animals. Two cofactors are used by CAOs to carry out this reaction: 2,4,5-trihydroxyphenylalanyl quinone (TPQ) and Cu(II). The overall reaction can be divided into a reductive half-reaction and an oxidative half-reaction. The mechanism for the reductive half-reaction is accepted, while the oxidative half-reaction is debated with two proposed mechanisms. This study will examine the role of the metal in the electron transfer from TPQ to oxygen in the oxidative half-reaction of the CAOs. To examine the role of metal in this mechanism, Cu(II) was removed from the active site and replaced with Co(II). After the metal was replaced, the enzymatic activity of the protein was measured. Recent studies have suggested that different CAO homologs may use each of the proposed mechanisms. The purpose of our studies is to gain a better understanding of the oxidative mechanism of a CAO from pea seedlings (PSAO) and from *E. coli* (ECAO). We are also examining the effect of  $H_2O_2$  on the activity of Co(II)-substituted PSAO and ECAO to determine if Co(II) is oxidized to Co(III), and if Co(III) can support catalysis in these enzymes.

### CLASSICS AND PHILOSOPHY HONORS BACHELOR OF ARTS

#### **COMPARING ANCIENT TO MODERN: HOW ANCIENT GREECE AND ROME PROVIDE INSIGHT FOR US CITIZENSHIPS AND IMMIGRATION IN THE 21<sup>ST</sup> CENTURY**

Viktoria Schumacher (Dr. Thomas Strunk)  
Classics and Philosophy Honors Bachelor of Arts

The United States has borrowed countless ideas from our predecessors in Ancient Greece and Rome, especially regarding government structure and function. I posit that in addition to the concepts we have already borrowed and developed, the United States should also utilize Greek and Roman conceptions of citizenship and migration in order to work towards a solution to the current immigration crisis. Through an investigation of Ancient Greece and Rome, I demonstrate three things. First, I show the rules, rights, and duties associated with different levels of citizenship in each society, proving the importance of citizenship status in both Greece and Rome. Second, I demonstrate the mechanisms of extending citizenship in Greece and Rome, showing the ways in which they developed over time as rules of citizenship and patterns of migration changed. Both Greece and Rome underwent several drastic changes in leadership which vastly altered both the limitations and the freedoms of citizenship; the consequences of these changes can be utilized as a roadmap for solutions to the immigration crisis of the 21<sup>st</sup> century. Third, I illustrate the place of migration in each society as it relates to citizenship. Ancient Greeks and Romans had different perceptions of 'the other' in society, and they thus viewed migrants in slightly different ways. Despite differences in general sentiment, both Greece and Rome were able to create systems that clearly demonstrated the place of migrants in society. These concepts, when placed in the context of current US citizenship and migration systems, reveal which approaches the US should avoid and which the US ought to borrow and develop in order to cope with the worldwide migration crisis.

#### **FROM RAMBO TO RETURN: HOW ROMAN VETERANS WERE TREATED**

Ryan Spolar (Dr. Thomas Strunk)  
Classics and Philosophy Honors Bachelor of Arts

Throughout history the military success of a country depends on how it treats its veterans. Using an introduction that lends itself to the modern view of veterans, this paper aims to explore the army and veterans in the late Republic and early Empire. This period oversaw several devastating wars to multiple Roman generations, as well as the expansion of Rome's influence and military prowess. Researching this time period there exists many examples from the times of Cimbrian War to the *Pax Romana*, with veterans fighting in multiple campaigns. The social class, citizenship status, and ethnicity of a soldier was crucial to the debate of what made him a Roman veteran. The heroic stories we possess often reflected a senatorial class of men in

the army rather than the majority of experiences of Roman veterans. Through works such as Lucan's *Pharsalia*, Sallust's *Bellum Jugurthinum*, and Cicero's *De Oratore*, combat situations and commentary from the authors arise that provide some context to specific military campaigns and veterans. Wounded veterans, and specifically how and where they were wounded, provided a somewhat dramatic return into civil society as opposed to those who did not receive scars or wounds. Secondary sources provide a historical foundation for the makeup of the Roman army, including aspects of ethnicity and class, to provide a basic definition of a veteran.

### **GENRE'S IMPACT ON WITCHES IN ROMAN LITERATURE**

Caroline Blandford (Dr. Shannon Byrne)  
Classics and Philosophy Honors Bachelor of Arts

In Roman literature, the portrayal of witches seems to change between genres and authors, but the overall characteristics remain the same. Many witches are presented in Roman literature, but three of the most important and defining are Horace's Canidia, Lucan's Erictho, and Seneca's Medea. Horace writes about Canidia in his *Satires* and *Epodes*. The *Satires* are a political set of poems which often have a mocking theme to them. The *Epodes* are a collection of many different types of poetry including friendly, invective, and political. Lucan examines his witch in an epic, which is typically full of magical figures. Lucan's *Pharsalia* is very different from traditional epics due to its darker themes, and the witch is one of few magical instances. In this epic, he subverts usual mythological intervention, so he emphasizes her dark characteristics. Seneca talks about Medea in a tragedy, the *Medea*. The genre calls for with an unhappy ending, which means Medea is doomed from the start. In the work, he waits until the end to emphasize witchy characteristics in her in order to make the ending more climactic and tragic. By looking at the authors and the intent of the genre that the witches appear, I find that many of the differences between them are on account of outside factors, not the type of the character herself. Many scholars examine how witches contribute to their story and why they might appear, but the implications due to genre and audience reception helps to reconcile what seem to be some differences. Some of the stories make the witches seem less fearful than others, but that is because the authors have a reason to use them that way, and are proving a point. Witches in Roman literature share a common theme of fear and unease for the audience, and the authors can play on those traits, despite the changes that may be made on them due to the genre.

### **GOVERNING THE HUMAN ANIMAL: AN EXAMINATION OF PLATONIC POLITICAL PHILOSOPHY THROUGH PETER SLOTERDIJK'S ACCOUNT OF THE LUXURIOUS ANIMAL**

Yan Idrissov (Dr. Timothy Quinn)  
Classics and Philosophy Honors Bachelor of Arts

This paper seeks to investigate the question of the compatibility of Platonic political philosophy, primarily from the dialogue the *Statesman*, with Peter Sloterdijk's modern conception of the human being as the luxurious animal. Sloterdijk's account of the human being as the luxurious animal is one that is anthropologically and biologically grounded, in which the human being, by its nature, is an animal that not only seeks luxury, but is co-created by luxury as well. This luxury can be characterized broadly, as those things that are artificial in nature, which separate the human animal from its environment in ways no other animal is able to completely achieve. Sloterdijk's account of the human being as the luxurious animal has stark and impactful philosophical implications for humankind and its relationship towards the artificial. With these implications in mind, the paper will seek to potentially problematize the political structure that is primarily found within the dialogue, the *Statesman*. Through consideration of the biological origins of the luxurious animal, as well as their implications, the paper will move to examine if Sloterdijk's conception of human nature is compatible with Platonic political philosophy as found within the *Statesman*. In short, this work intends to see if Plato's ancient conception of the ideal statesman as well as his ordering of the six possible regimes, is able to apply to a modern account of human nature as found in Sloterdijk's luxurious animal.

## **“I SEE” SAID THE BLIND MAN; “I KNOW” SAID OEDIPUS**

Emma Barlow (Dr. Thomas Strunk)

Classics and Philosophy Honors Bachelor of Arts

Sight in the ancient world is best understood through Greek tragedy and philosophy. There is a certain duality of sight that is present in tragedy – physical and metaphysical. Physical sight is represented through “vision” and “sight” itself. Metaphysical sight is represented through “knowing” and “understanding”. Physical and metaphysical sight do not necessarily need each other, but the combination of the two results in higher wisdom, something that is sought by one of the most prominent figures in Greek tragedy, Oedipus. In fact, *Oedipus Tyrannus*, *Heracles*, and *Prometheus Bound* best exemplify the duality of sight in tragedy. The seers in Greek tragedy also provide a means for the audience to visibly see a connection of the duality.

## **MANNING UP WITH THE TIMES: HOW THE CONCEPT OF ‘VIRTUS’ SHIFTED AMONG ANCIENT ROMAN AUTHORS**

Nichola Tarnowski (Dr. Thomas Strunk)

Classics and Philosophy Honors Bachelor of Arts

‘*Virtus*’, originating from the Latin ‘*vir*’ which means “man”, was a broadly defined, abstract concept for ancient Romans that pertained standards of ‘manliness’. That being said, the standards of manliness shifted as time progressed. In the early, pre-classical era of Rome, the word predominantly referred to one’s martial courage. In a highly militaristic society that thrived on victories and conquests in battle, manliness was measured by how well a man was able to fight and defend Rome. However, as Rome transitioned into the late Republic, it began to face many more internal threats, including but not limited to Sulla’s dictatorship, the Catilinarian conspiracies, and the civil wars. There was now a need for courage to be displayed somewhere other than the battlefield. A certain type of “manliness” was needed to combat the internal struggles. As a result, the concept of *virtus* would be portrayed in different lights by different authors. The purpose of this paper is to trace how the concept of *virtus* shifted among different authors from three different, yet very turbulent time periods: the late Republic; the Augustan Age; the Neronian Age. One author from each time period will be analyzed-Cicero, Virgil, and Seneca the younger- in order to determine in what ways their respective times and perspective of those times shaped the concept of *virtus* in their writings. The goal is to highlight what they are each doing differently and uniquely with respect to their portrayal of *virtus*, and why.

## **REASSESSING CAUSES AND FINDING SIMILARITIES BETWEEN THE NIKA AND ANTIOCH RIOTS**

Ty Richer (Dr. Thomas Strunk)

Classics and Philosophy Honors Bachelor of Arts

The reign of the Byzantine emperor Justinian, from 527 to 565, despite its many high points and achievements, was a struggle for him and his people. One of his most famous, or infamous, challenges was during the Nika riots. During this time Justinian sees the people of Constantinople attempt to crown a usurper as emperor instead of him. As Justinian convened with his advisors, hiding from the mob in his palace, one question must have rung true in his mind: how did this happen? This presentation answers this question while also giving an overview to the time and the people involved. First, by looking at the tradition and history of Roman and Byzantine chariot racing and circus factions, a picture of who these rioters were starts to take shape. Next, the presentation investigates the social and political background of the riots. Of the 13 riots that occurred during Justinian’s reign, this one posed the greatest threat to his power and rule over the empire. In the chaos, the rioters list their demands for Justinian. Previous research has taken these demands at face value, but the real sparks that started this conflict are much deeper. Instead, the unique political and economic situation in which the people of Constantinople find themselves helped to fan this flame. At last, the actual riot is looked at, particularly through the lens of these outside influences. To show how these situations helped to fuel the riots, the Nika riot will be compared to other riots and mob activity from around the same time, particularly the Antioch riot. Since both of these riots had a similar unfolding of events and consequences, the question of how did the demands and background to each riot effect these similar structure.

## **THE REVOLUTIONARY GALEN: GALEN AND HIS LEGACY AS A TURNING POINT IN ANCIENT MEDICINE**

Morgan Doty (Dr. Thomas Strunk)

Classics and Philosophy Honors Bachelor of Arts

Galen of Pergamum was a second century physician, philosopher, pharmacist, physiologist, and surgeon whose medical philosophy, Galenism, influenced medicine through the Middle Ages. While many scholars hesitate or explicitly refuse to label Galen as a turning point in the history of medicine, I have gathered evidence that indicates he indeed shifted the paradigm of medicine before him. By looking at many of Galen's own writings and some secondary scholarship on the man and the issues reflected within those texts, it becomes evident that Galenism displays many of the elements of Thomas Kuhn's scientific revolution. In reading these texts I focused on three particular areas in order to establish a fundamental change in medicine: his education, his approach to diagnosis, and his emphasis on surgery and physiology. While the influence of the Hippocratic tradition on Galen was evident, his diversion from it and his opposition to the practices of his time must also be considered. Galen hated the medical sects of his time, disagreed with many of his contemporaries on proper practice and procedure, and earned himself a rather negative reputation as arrogant. Beyond all his talk, though, Galen had the skills to back it up. Galen's discoveries about the pulse and his works on prognosis led to favorable outcomes for his patients. Furthermore, he was a skilled physician, serving as the imperial physician to emperors like Marcus Aurelius, and was the official physician to the gladiators in Pergamum. While working with the gladiators, he often performed surgery that was aided by his extensive, at least for his time, knowledge of anatomy and physiology. Galen often performed demonstrations of anatomical dissections and used them as lessons to teach students, while many other physicians of his time neglected the utility of dissection. All of these factors, and more, contributed to Galen's legacy which transformed medicine from the ill-informed mystical tradition before him to the anatomically based medicine we gleaned from the Renaissance. None of it would have been possible without Galen.

## **THE TRANSACTIONS OF MORTAL COIL: HELLENIC MEANING IN THE SUFFERING OF THE ILIAD AND THE ORESTEIA**

Stephen Bothwell (Dr. Shannon Byrne)

Classics and Philosophy Honors Bachelor of Arts

Why is it that we, as human beings, suffer? When even human language fails to define suffering conceptually, answering this question may seem impossible. Striving to overcome this obstacle, I examine two time-honored Greek texts of the Archaic Period (776 B.C.–500 B.C.) and the Classical Period (500 B.C.–323 B.C.) to grasp at the cosmological role that suffering fulfilled and the cultural development of the human view of suffering. First, Homer's *Iliad*, solidified during the Archaic Period, portrays a system of equivalence between honor and suffering within the heroic code. This heroic code is bound by human mortality but aims at achieving immortality through κλέος (*kleos*), an ultimately immaterial and reputational glory. That code is thrown into disarray by Achilles; in being slighted by the Greek king Agamemnon, Achilles contorts the system in novel but permitted ways that increasingly reveal the flaws in the heroic code due to the unquantifiability of suffering. Inheriting this Homeric tradition, Aeschylus' *Oresteia* of the Classical Period broadens the Archaic suffering-honor exchange. It does so by superseding the heroic code with the Zeus-ordained principle of πάθει μάθος (*pathei mathos*), "learning by suffering." The three plays of the *Oresteia* detail an overall progression toward wisdom through the rectification of an inherited misconception: that human-driven vengeance is Zeus' justice. Such a misconception is fueled by a deeper misunderstanding of Zeus' law of πάθει μάθος as δράσαντι παθεῖν (*drasanti pathein*), "for the one having done, to suffer." Orestes' willingness to follow the gods' commands and Athena's establishment of the legal institution of the Areopagus allow for the pursuit of wisdom and of true justice that breaks down the plays' cycle of bloodshed. In synthesizing my twofold analyses, I conclude that the desire for wisdom concerning how to live the best life motivated the Greek evolution of suffering's transaction from honor to learning.

## ECONOMICS

### **LEISURE TIME ALLOCATION BY WAGE AND EDUCATIONAL LEVEL**

Rachel McFadden (Dr. Laura Youderian)  
Economics

This paper attempts to empirically substantiate that people of different wages and education levels use their leisure time in different ways. We attempt to explore the intersection of the economic definition and trends of leisure and the sociological constructs surrounding the utility that certain leisure activities yield. Our unique contribution to this body of literature is hypothesizing that people with higher wages/education choose to allocate less time per day to leisure but spend the limited time in different ways than people of lower wages/education. Further, we believe the leisure activity choices of more wealthy or educated individuals correlate to higher levels of utility per “unit” of leisure. Our work includes a thorough literature review, model, and data analysis from the 2017 American Time Use Survey (ATUS).

### **THE ROLE OF A NATIONAL ENTERPRISE IN REDUCING FOOD WASTE**

Lucy Shroder (Dr. Len Sauers)  
Economics, Sustainability and Society

Throughout the semester, I worked to track the waste reduction progress throughout the Kroger enterprise and to support the production of innovations. I learned about internal waste tracking methods and translated that data to be submitted to Waste Wise and the Food Waste Challenge, EPA programs designed to track and create goals around organizational waste production. In the second aspect of the project, I contributed to implementing a date label reform program. Kroger is working to streamline the language used in their food labels to reduce consumer confusion over when their food is no longer good to eat. By clarifying Kroger’s date label messaging, we hope to reduce consumer food waste. I will be tracking progress, initiating new products for label reform, and conducting inter-departmental and external communication to keep all relevant groups up to date on changing processes.

## HEALTH SERVICES ADMINISTRATION

### **ASSESSING 30-DAY READMISSION RATES OF PATIENTS WITH CHRONIC OBSTRUCTIVE PULMONARY DISEASE**

Brooke Conkle, Molly Kidwell (Dr. Eileen Alexander)  
Health Services Administration

Chronic Obstructive Pulmonary Disease (COPD) is a progressive illness causing airway obstruction with no cures but with proper care management and treatment techniques, COPD can be manageable. In addition, healthcare insurance “payers,” including the U.S. Centers for Medicare & Medicaid, do not reimburse hospitals for care given to patients if they are readmitted within 30 days. The first aim of this project was to assess 30-day readmission rates of patients with COPD. The second aim of the project was to identify themes associated with increased COPD readmission rates. The Christ Hospital (TCH) on-site team conducted 47 chart reviews in Epic, a clinical database. A stratified analysis was used to differentiate readmission rates between the Medicare population ( $\geq 65$  years of age (YOA),  $n=33$ ) and the  $<65$  YOA population ( $n=14$ ). Over half of all the patients were provided with incomplete or incorrect instructions in their After-Visit Summary (AVS) upon discharge.  $\frac{2}{3}$  of patients with a TCH Primary Care Physician (PCP) received a follow up within seven days of discharge compared to  $\frac{1}{3}$  of patients who have a non-Christ Hospital PCP. The off-site team working with the Xavier Center for Innovation interviewed TCH patients and a TCH-PCP using design thinking interview techniques and identified “Patient Education”, “Patient Engagement”, and admissions for “Multiple Comorbid Conditions” as the recurring themes. Teams were then able to provide TCH recommendations to help implement effective tools to prevent such high readmission rates including requiring PCP fields on the AVS and Discharge Summary as well as scheduling follow-up appointments at time of discharge.

**GHANAIAN HOSPITAL SANITARY TOILET FACILITIES AND POPULATION HEALTH: KORLE-BU-TEACHING-HOSPITAL'S (KBTH) ACCRA, GHANA**

Emily Helton, Saharish Ijaz (Dr. Eileen Alexander)  
Health Services Administration

Ghana's medical system is centered heavily in the two largest cities: Accra, the capital with ~2 million inhabitants, and Kumasi, with ~1 million citizens. Diseases caused by lack of adequate sanitation pose great health risks. According to the World Health Organization (WHO), nearly 90% of the population lack adequate toilet facilities. This leads to a high incidence of infections linked to contaminated water, such as diarrheal illnesses and bilharzia /schistosomiasis. Standard quality improvement methods and tools were used to organize and analyze the data. Pareto and bar charts were used to organize the data into groups e.g., safety and disability features, to demonstrate a high importance for a quick and inexpensive impactful outcome. Twenty-four features were evaluated (n=2 units, 7 wards) from the Korle- Bu Teaching Hospital (KBTH). 100% of the sanitary toilet facilities (STFs) contained flush mechanisms. Only 10% of the sanitary facilities were safety and disability compatible according to the WHO standards. 43% of the facilities have soap dispensers and of those, 29% have soap. 14% of the bathrooms meet WHO recommended toilet: bed ratio. Some facilities exist for wheel chair bound users, although KBTH units/wards surveyed do not fully meet WHO standards. Soap availability is an achievable priority to mitigate risk. Direct ID risk to patients and visitors should be evaluated. Global QI is challenging, time-labor intensive, albeit worthwhile for students/trainees to learn team leadership roles, and to build sustainable bi-continental partnerships with multicultural learning. Using standard quality improvement methodologies, we aim to evaluate and improve the number, visibility, accessibility and condition of hospital sanitary facilities available to patients' relatives and sustain minimum globally-recommended standards.

**XAVIER BS-HAS STUDENTS SUPPORT POPULATION HEALTH: CREATING A GENETIC DATABASE FOR TRIHEALTH CANCER INSTITUTE**

Julia Schlich, Christina Driskell, Kendall King, Colleen Moore (Dr. Eileen Alexander)  
Health Services Administration

Genetic Counselors (GC) complete reports required for National Comprehensive Cancer Network (NCCN) guideline compliance. The original processes were time and labor intensive, prone to inaccuracy, and far behind for use by providers. Since 2017, Xavier Students have completed multiple quality improvement data-based projects for the GCs at the TriHealth Cancer Institute (TCI). Standard quality improvement (QI) methods and tools were used to review, prioritize and create analyzable databases, i.e., one datum per cell. Data were combined in Excel® from several platforms: Epic® (clinical), FoundationOne® (genetic, in pdf format), Progeny® (genetic counselor's health record system), and TriHealth Cancer Registry (required by law). Data dictionaries and written instructions were created to define data entry, assess areas requiring attention, and train users. Inconsistencies and redundancies were corrected and "cleaned," automated formulae updated summary statistics in real time. After QI analysis, one new process led to a dramatic reduction in time from several weeks to 4 hours. Xavier students created an analyzable dataset for the tracking of 8 "Hot Genes", which are priority heritable cancer genes. During a 4 month period, all patients referred for genetic counseling were screened for the 8 genes; the most prominent genes were PTEN and RB1, with 12 and 16 patients flagged, respectively. NCCN procedures specifically recommend Lynch Syndrome (LS) screening for specific cancers. LS is a genetic condition that predisposes the patient to multiple cancers at a younger age. As a TCI QI initiative, LS screening tests, called immunohistochemistry (IHC), are tracked. By creating a new LS tracking process with Excel® to merge data, 11% of patients with an abnormal IHC result were diagnosed with Lynch Syndrome. These data are now fully analyzable, complete with graphics used by GCs and oncologists to inform and educate patients. Genetic counselors now focus time and effort on interpreting data, offering screening of heritable genetic variants to patients' families, and ensuring National Comprehensive Cancer Network guidelines are met.

## HISTORY

### **A DIM FUTURE: THE DARK HISTORY OF THALIDOMIDE AND ITS CHANGING CONTRIBUTION TO THE WORLD**

Mackenzie Ferguson (Dr. Penelope K. Hardy)  
Department of History

Developed by German pharmaceutical company Grünenthal, the drug thalidomide was created and sloppily tested in the late 1950s. Used as a sedative drug, it was advertised to be safe for everyone, including expectant mothers. This was later proven wrong. This popular drug gained worldwide attention and was soon sold over-the-counter in 46 countries. While thalidomide was reaching millions, over in the United States, the FDA challenged the validity of this drug in what soon became a long battle between one FDA medical officer and an aggressive pharmaceutical company. As years went by, complaints and theories of the supposed side effects finally exposed thalidomide as the cause behind numerous birth defects. Now fifty years later thalidomide is no longer popular, but remains a highly debated topic with government policies regarding thalidomide victims. Even several decades after the tragedy, countries and pharmaceutical companies have yet to clean up their act in ensuring that thalidomide will cause no more harm. Many survivors born with severe congenital malformations still demand compensation from Grünenthal for the pain they have experienced. Drug regulation has become more controlled since then, but countries still struggle with the regulatory framework necessary to prevent another scare. After all the harm that pharmaceutical companies caused with the drug, do these companies deserve a redemption? Can the idea behind thalidomide transform from a drug that once caused harm, to a drug that can now aid in leprosy treatments and even help with certain cancers? What can only be recognized now is that thalidomide and Grünenthal will be battling with their dark past for decades to come.

### **CELEBRATING 50 YEARS OF WOMEN AT XAVIER**

Grace Longmuir (Ms. Anne Ryckbost)  
Department of History

This project focuses on the experience of women at Xavier because 2019 is the anniversary that marks 50 years of women in Xavier's undergraduate program. The research begins in 1914 when women were first admitted into Xavier. In 1914 (83 years after Xavier's founding), women religious were admitted into Xavier's summer school courses in order to get teacher certifications, however they were not allowed to attend the undergraduate day school. While the research conducted focuses partly on early women and modern women at Xavier, the main focus of the research spans from 1969-1986. This includes the decision by Xavier administration and Jesuit leaders on the admission of women into Xavier's undergraduate day school, the push for students to have dormitory inter-visitation rights, the opening of the Breen Lodge women's center and its controversial closing just 8 years later, and the acquirement (and subsequent closing) of Xavier's Edgecliff campus. The research paints a timeline of women's "firsts" at Xavier, such as Xavier's first woman athlete and undergraduate valedictorian. The research reveals the challenges Xavier women have faced and continue to face to this day. The research is meant to celebrate the women who have come before us and to celebrate the progress we have made toward equality and inclusiveness on Xavier's campus thus far.

### **FROM WARREN COUNTY TO FLINT, MICHIGAN: THE ENVIRONMENTAL JUSTICE MOVEMENT**

Alex Ackerman (Dr. Penelope Hardy)  
Department of History

The relationship between race and the environment reveals the inequalities that persist today, reflecting the multi-faceted nature of racism that has historical roots. The environmental justice movement originated in the 1980s as a result of the cooperation of minority communities who organized after facing the common challenge of living in close proximity to toxic waste sites. Specifically, protests in Warren County, North Carolina marked the beginning of the movement as a result of the placement of a landfill containing toxic waste near a predominately African-American community. Beginning in 2014, the modern controversy of the water crisis in Flint, Michigan has manifested due to social, political, and economic factors and reflects the history of environmental racism. These factors illuminate the institutions and agencies that have enabled such inequalities to persistently influence the lives of people of color. The ongoing crisis has affected both the city at large and the lives of the residents, causing skin rashes, hair loss, Legionnaires' disease, and fetal

complications, in addition to impaired cognitive development and behavioral changes in children. These health consequences have predominately impacted minority neighborhoods within the city of Flint, demonstrating the manner in which environmental racism is not strictly a phenomenon of the past. Furthermore, the history of Flint highlights the underlying causes of the crisis, especially those at the institutional level, as well as the greater patterns between race and the environment. This essay traces the history of the environmental justice movement in order to argue that the water crisis of Flint, Michigan is a modern example of environmental racism, examining institutional and local factors that have manifested political, social, and economic effects.

### **JEHOVAH'S WITNESSES AND BLOOD TRANSFUSIONS: ETHICAL AND LEGAL IMPLICATIONS**

Laura Walker (Dr. Penelope Hardy)  
Department of History

Since the 1870s, Jehovah's Witnesses have been a dynamic, fast growing religious sect. Their door-to-door evangelical method of recruitment and refusal to celebrate common holidays like Christmas has made them somewhat of a religious pariah, but also gives them considerable attention. No doubt one of their most controversial beliefs, however, is their systemic refusal to accept transfused blood, even in a potentially life-saving scenario. Witnesses maintain that blood is sacred to Jehovah, and therefore cannot be tainted, even in dire circumstances. This action from the Witnesses created an ethical conundrum in the medical community, and has in turn led to a great deal of practices regarding bloodless medicine and other lifesaving techniques that bear in mind the wishes of the patient. Blood has always been thought to be an important factor in healing the body and preventing disease. In the 18<sup>th</sup> and 19<sup>th</sup> century, bloodletting was a common practice that was believed to cure a multitude of ailments. But in the early 20<sup>th</sup> century, doctors realized the lifesaving power of transfusions in the treatment of severe injuries. As a result, bloodletting was phased out of the medical community, as transfusions offered a much more effective solutions. Witnesses, however cite scripture to support their refusal to accept transfused blood. According to the Watch Tower Society is that blood is sacred to Jehovah, and that the Old and New Testament clearly indicate that people should abstain from consuming blood in any form. At one time, the medical community viewed the denial of transfused blood as nearly suicidal. This viewpoint has changed, however, and considerable advancements in bloodless medicine have been made. The ethical issues brought up by the Witnesses prove that while science denial goes against the grain, it can sometimes be helpful in developing technologies and practices that respect patient autonomy.

### **UNDERSTANDING THE IMPACT OF THE FEDERATION OF COLORED WOMEN'S CLUBS: LEARNING AND CELEBRATING BLACK WOMEN IN CINCINNATI**

Kaitlyn Roach, Gabriella Scolio (Dr. Christine Anderson)  
Department of History

Our project has dragged us in many different directions but the one thing that has remained is our goal to create something that celebrates the achievements of black women while providing an entry to understanding black women's suffrage in Cincinnati. We have been able to accomplish this goal by working directly with the Cincinnati's Federation of Colored Women's Club- a historic organization that has served as our community partner throughout our research. Through our research, we have focused on the founder of the Cincinnati Federation, Mary Fletcher Ross and have used her connections to the Allen Temple, an African Methodist Episcopal Church in Cincinnati, to provide an entrance to understanding the larger role women of the Federation had in the suffrage movement. We were able to discover newspaper articles detailing a visit from prominent black suffragist Mary Church Terrell to the Allen AME temple, under the invitation of Mrs. Ross and her husband Bishop Isaac Nelson Ross. We have compiled a brief biography of Mrs. Ross, her census information, entries from *Centennial Encyclopaedia of the African Methodist Episcopal Church* detailing information about both Mrs. and Mr. Ross, as well as larger background information about Mary Church Terrell. With this information, we have created a piece that hangs in the Federation's club house that contains a biography and image of Mrs. Mary Fletcher Ross. In addition, we have created a collection of history pins that provide a history of the Federation, their clubhouse, their founder and the visit from Mary Church Terrell. Looking to the future, we are working on the application to grant the clubhouse of the Federation, located at 1010 Chapel Street, a historical marker- part of this process includes applying for various grants to help alleviate the cost of the marker.

## MANAGEMENT

### **INFAMOUS EVENTS, FIRM RESPONSE, AND THE IMPLICATIONS FOR FIRM REPUTATION**

Zachary Dutro (Dr. Zachary Russell)  
Management

Infamous events are a reality for most firms. When infamous events occur, public perceptions of the firm often change and firm reputation can deteriorate. Firms attempt to mitigate the negative effect of infamous events by responding appropriately to their stakeholders. In this paper we proposed a contingency-based process of how firms respond to infamous events and how contextual factors affect the method and efficacy of their responses. We theorize factors such as the magnitude of the infamous event, reactions by and power of specific stakeholder groups, and timing influence the process by which firms respond to infamous events. Specifically, we examine how firms determine whether a response is necessary, when to respond, how to respond, who to respond to, and, when necessary, if subsequent responses are needed. Finally, we look at how firm responses affect stakeholder perceptions of the firm and, in turn, affect firm reputation. Implications for practice and theory are then discussed.

### **RESTORATIVE BEHAVIOR IN ORGANIZATIONS: A REVIEW AND PROPOSED MODEL**

Libby Grace (Dr. David Zoogah)  
Management

The extant leadership literature shows a profusion of bad leadership, the process by which individuals in leadership roles enact ineffective (e.g., incompetence) and unethical (e.g., corruption) behaviors (Alford, 2008; Kellerman, 2004; Tepper, 2007). When leaders behave incompetently or unethically, the company is negatively affected by bad reputation, potential increased legal costs, employee retention, customer satisfaction, work climate, and overall productivity. The Blanchard Company estimates that poor leader practices costs a typical organization an amount equal to as much as 7% of annual sales and between 9% and 32% of voluntary turnover. Research shows that bad leadership costs American companies, for example, more than half their human potential or reduced worker productivity (Rosen & Brown, 1996). Even though research suggests that good leadership can reverse some of these negative outcomes, extant research suggests that followers also have a role to play (UhlBien et al., 2014). Followers who want to contribute value to organizations engage in behaviors that restore value diminished as a result of bad leadership behaviors (Zoogah, 2014). Such behaviors are restorative, they are actions that are in response to bad leadership behaviors and are intended to restore value reduced as a result of the ineffective or unethical behavior of the leader. This study employed a literature review to understand and analyze bad leadership and follower restorative responses published in the literature. We find that followers respond in passive and active ways which are classified as exit, silence, third party, voice, and repair, where voice is the most common follower response.

### **WILL ORPHAN DRUG ACTS HELP OR HURT INCUMBENTS?**

Madeline Teed (Dr. Mina Lee)  
Management

The Orphan Disease is defined as the disease that less than 200,000 people in the United States suffer. Due to the small market, biopharmaceutical firms do not have an incentive to develop cure or treatment for the Orphan Diseases. To address this issue, the U.S. Congress has passed a series of Orphan Drug Acts. The Orphan Drug Acts offers federal funding for research, an expedite FDA process, and 7-year market exclusivity, tax credits, exemptions from fees and other benefits. According to the industrial organization economics, the Orphan Drug Acts would reduce the entry barrier of the biopharmaceutical industry. We argue that the Orphan Drug Acts is good news for the biopharmaceutical industry and enhance the performance of the incumbents. We also assert that these positive effects on incumbents would be positively moderated with the market capability, R&D capability, and market power in the distribution channel of the incumbents.

## MATHEMATICS

### **RESERVING EFFICIENCY**

Mackenzie Vernon (Dr. Max Buot)  
Actuarial Science

Claims reserving in insurance is a way for a company to prepare for specific losses. Each time there is a claim a reserve is issued. This reserve is an amount of money that the adjuster believes the claim will cost the company. We have used a dataset that contains how many claims' reserves increased by, decreased by, and were created over 100,000 dollars. The data is over three years and has the month and year that the action took place connected to its claim number. My research was to see on average how much more or less money was being paid out than originally expected. The question was whether or not reserving is being done efficiently. Another question answered was whether a certain year was better or worse for reserving. Was there an outlier within the three years or was the data the same throughout all three years? Lastly, we were interested in if a certain month was contributing to reserving differences. If perhaps a season of the year there was less efficiency, or if the holidays may contribute to low efficiency. Overall, just checking to see if the month of the year affects the original reserve being issued for specific claims.

### **THE AVERCH-JOHNSON EFFECT ON THE FIRM BASED ON ITS INDUSTRY AND PRICE FOR CAPITAL AND LABOR**

Jun Bum Cho (Dr. Hem Raj Joshi)  
Department of Mathematics

The Averch-Johnson Effect states the firm, whose objective is to maximize profit, would substitute labor for capital under a regulatory constraint. In general, the firm does not welcome a regulation because it causes a market inefficiency so that it hurts profit. The purpose of this paper is to examine if there are different effects in regard with a type of industry and price for the inputs. This paper shows that the Averch-Johnson Effect works in all cases besides the industries with a capital-heavy and relatively higher labor cost than capital and with a labor-heavy and relatively higher capital cost than labor cost. These two industries experience higher profits under the regulatory constraint.

## PHILOSOPHY, POLITICS, AND THE PUBLIC

### **A HOUSE DETACHED: THE PROBLEM OF CONGRESSIONAL REPRESENTATION**

Matthew Miller (Dr. Mack Mariani)  
Philosophy, Politics, and the Public

This paper addresses growing concerns regarding the adequacy of Congressional leadership, and its relationship to the American public. This examination roots itself in the writings of both the Federalist Founders and their Anti-Federalist contemporaries but explores the philosophical roots and institutional problems that have led to our modern issues, with a particular focus on the growth of a political elite that seems more and more distant from those they are meant to represent. I will suggest several paths forward, ranging from minor redistricting legislation to an expansion in the House's size in order to address these problems.

### **AN AMERICAN EXPECTATION FOR UNIVERSAL HEALTH CARE**

Shannon Cunningham (Dr. David C. Blake)  
Philosophy, Politics, and the Public

Among other political debates, it is without question that health care remains at the forefront of American politics as a highly divisive topic. Bioethicists, international health organizations, liberal politicians, and over 150 other countries' constitutions utilize the phrase "health care is a human right" as an argument for instituting a universal health care system; yet, many Americans disagree with this idea and instituting such a system in America. This study begins by exploring the history behind and the contemporary implications of this phrase. While access to health care may be justifiable on the basis of human rights, the latter portion

argues for approaching the American health care debate in another, perhaps more compelling way. In America, the government guarantees and funds various publicly guaranteed services such as clean and running water, functional highways, and, most notably in this case, basic education. Access to basic health care like those public services are not written into American law. Rather, they are services already implicit in the American expectation that government exists to secure for its people life, liberty, and the pursuit of happiness.

### **AN EXAMINATION OF RIGHTS AND RESPONSIBILITIES IN THE PUBLIC SPHERE**

Lily Hutkowski (Dr. Suparna Chatterjee)  
Philosophy, Politics, and the Public

Rights are a necessary component of civil society. However, when rights are the sole basis for the formation of robust public spheres what is underemphasized is the notion of responsibility. This thesis focuses on the need to include both the notions of rights and responsibilities in any discourse on the public good. In my thesis, I consider the legacy of civic republicanism in contrast to liberalism to argue that rights without responsibilities cannot create inclusive and engaging public spheres. I contend that motivating civic responsibility and public spiritedness is essential to safeguard the future of the republic as envisaged by the founders of the United States. Finally, I argue that in our contemporary, fast-paced globalized world, it is even more urgent to consider responsibility in public life as it provides the scaffolding for good global citizenship.

### **ELECTORAL SURPLUS: ANALYSIS OF OHIO ELECTED EXECUTIVES**

Ethan Alter (Mr. Sean Comer)  
Philosophy, Politics, and the Public

This paper will investigate the function and propriety of Ohio elected executives. This investigation is multidisciplinary, using the tools of history, constitutional theory, and political science. At present, the citizens of Ohio vote for not only their Governor and Lieutenant Governor, but also for the State Auditor, Attorney General, Treasurer, and Secretary of State. I argue that it is not beneficial for each of these positions to be chosen by election, and that this surplus of electoral choice obscures where power lies in the state government.

### **IN OUR OWN BEST INTEREST: A CLOSE STUDY OF THE FEDERALIST PAPERS AND THE ROLE OF SELF- INTEREST IN OUR REPUBLIC**

Colin Lang (Dr. Michelle Brady)  
Philosophy, Politics, and the Public

In the modern United States, we often hear public figures talk about civic virtue or a return to Founding principles. However, few Americans have an idea of what that means outside of the idealized or demonized views of the original state of the American Republic. This thesis offers an in-depth look at the actual words of two of the most important figures to the American Founding, Alexander Hamilton and James Madison, to better understand the system that we have inherited from them. Through the examination of Hamilton and Madison's writings in *The Federalist Papers*, we see that the system of governance for the United States is one based in realism and political pragmatism. In other words, the Founders took humanity as it was and attempted to create a system that would utilize its fundamental self-interest to better American society as a whole.

### **THE UNITED STATES AND ITS ADMINISTRATIVE GOVERNMENT**

Patrick Rohs (Dr. Steven Frankel)  
Philosophy

In today's society the Constitution of the United States is regarded as one of the most sacred documents in modern human history. It is viewed as a document that should be preserved and respected by the citizens of this country and defended by its leaders. However, do the practices of our modern government uphold the principles that are dictated by this important document? Some would argue that they do not. With the Federal Government resorting to mostly administrative control, Congressional oversight seems somewhat

absent. Hence, some may argue that the executive branch holds too much power and appointed officials are trusted with too much responsibility. This thesis will, first, clearly establish the principles of the federalist argument as it relates to that of the anti-federalist. Second, it will state why the administrative government is at odds with these principles. Finally, it will use the Housing and Urban Development Administration as a case study to draw conclusions about the possible necessity of administrative control.

### **WE THE PEOPLE: CRITICAL THEORY, CROWDSOURCING, AND THE FUTURE OF PUBLIC POLICY**

Rafael Luciano (Dr. Jackie Lyon)  
Philosophy, Politics, and the Public

“We the People,” the first phrase of the United States Constitution is arguably three of the most valuable words in American history. The United States Constitution is predicated on the concept of democratic representation. Considering, this new age of widespread technology, crowdsourcing can be implemented to maximize said representation. In other words, the purpose of this thesis is to define and analyze the phenomena of crowdsourcing, and present crowdsourcing as a potential facilitator to avail our representative governance. Although this may seem as though I’m replacing traditional methods of representation, I argue that crowdsourcing is an advantageous addition to said traditional methods. My proposal is designed to put forward a pilot non-pecuniary crowdsourcing model that could effectively utilize crowd participation in progressing democratic governance. This rationalization is constructed through the deduction principles of critical theory, the analysis of the transformation of the public sphere, and the acquisition of knowledge on modern political crowdsourcing initiatives.

### **WHY HOPE VI ISN'T SO HOPEFUL: CONCENTRATIONS OF POVERTY IN AMERICA'S INNER CITIES**

Brianna Ledsoe (Dr. John Fairfield)  
Philosophy, Politics and the Public

The affordable housing crisis that plagues America's cities is preventable, but not without the recognition that the structures of urban renewal used to mediate the housing market have exacerbated poverty and discrimination, and created concentrations of poverty tied to underdevelopment. The Hope VI program's execution by the Department of Housing and Urban Development was intended to deconcentrate the legacy of poverty in inner city projects. Whether it was successful in making mixed income communities is a highly debated question by political scientists and social activists alike. This paper observes whether or not the Hope VI plan in Cincinnati's West End successfully created a mixed income neighborhood by examining census tract data over the time of development to the present. Additionally, it examines the history of housing and development as a vehicle that created the housing crisis we see today.

## PHYSICS

### **EXPLORING THE EFFECTS OF SINGLE POINT MUTATIONS OF ARABIDOPSIS THALIANA CRYPTOCHROME 1 (AT CRY1), A PLANT PROTEIN INVOLVED IN BLUE LIGHT RESPONSE**

Emily Shockley, Lillian Haerr (Dr. Justin Link, Dr. Dorothy Eagle)  
Department of Physics

Cryptochromes are proteins that act as photoreceptors regulating development and the circadian clock in plants. It has been shown that mutations in cryptochromes, specifically AtCry1, alter the functionality of the proteins. These flavoprotein photoreceptors mediate growth, leaf expansion, and floral initiation. They act through blue-light dependent photoreduction of flavin adenine dinucleotide (FAD) via an electron transport chain. In the dark state, the flavin is oxidized and when stimulated with blue light, it is semi-reduced and in the active state which arguably causes protein conformational change and signal transduction. This photoreduction of FAD can be tracked using visible light absorption as the spectra of the oxidized and semi-reduced forms differ. Specifically, the oxidized FAD has an absorption at 450 nm and once semi-reduced, the 450 nm peak decreases and there is an increase in absorption at 550 nm. Mutants studied show significant difference in appearance and plant growth in blue light when compared to native plants. Differences in absorption between mutant and native proteins were used to analyze potential differences in the photochemistry involved in plant growth.

## **PROBING CONFORMATIONAL CHANGE IN CRYPTOCHROME VIA PHOSPHORYLATION**

John Sternen, John Paul Kavanaugh (Dr. Justin Link, Dr. Dorothy Eagle, Dr. Stephen Mills)

Physics, Biology, Chemistry

As the global climate begins to destabilize, the mechanisms in regulating plant growth become very important. By understanding the mechanism, we can manipulate it in plants, so they can grow in a changing climate. This will help to reduce the problem of food shortages in the future. This indirectly helps solve other conflicts such as violent conflict, refugee resettlement, and reduce the risk of terrorism. A protein that is involved in regulating plant growth is cryptochrome. Many experiments are being done to determine the mechanism that produces cryptochrome function. Cryptochrome is a protein that is a blue light photoreceptor. When cryptochrome is stimulated by blue light the plant hypocotyl growth is inhibited. In this investigation an analyze of cryptochrome was completed to determine if specific amino acid mutations caused a hindrance in conformational change. This would provide information on essential amino acids for cryptochromes ability to undergo a conformational change and produce its function. Analyze was completed using western blots and comparing degrees of phosphorylation between mutant and wildtype groups. Upon conclusion of our investigation, it was determined that the amino acid mutations hindered cryptochromes ability to undergo a conformational change. Indicating that the specific amino acids in the wildtype sequence are essential for cryptochrome to undergo a functional conformational change.

## **CRANIAL IMAGE GUIDED ALIGNMENT ACCURACY AS A FUNCTION OF ANATOMICAL LOCATION**

Anthony Plochocki (Dr. Justin Link)

Department of Physics

The purpose of this study is to calculate the accuracy of an image-fusion software used for radiosurgery cancer treatment. This software is called ExacTrac, made by BrainLab. The fusion software is programmed to analyze three respective images: a 3-dimensional CT scan image taken prior to radiation treatment and two X-rays taken in known XYZ space on the treatment couch. This allows the program to perform fusion algorithms to create the most realistic and accurate image for treatment. In order to test the accuracy, an anatomical head phantom (a human skull with acrylic layering) was placed in a CT scan and potential tumors (isocenters) were electronically contoured in the CT image and analyzed for treatment. Six tumors were placed in Central, Posterior (back), Right, Anterior (front), Inferior (bottom), and Superior (top) Brain locations. Once the radiation treatment machine (linear accelerator) was aligned on the isocenter, a known shift of 0-3 millimeters was made. The hope was to find whether complex images, such as that of the anterior location, where the jaw, optic canal, and nasal bones were taken into account in the image, supplied a greater accuracy than that of a posterior position, where the software would only have image information of the skull to fuse. In order to quantify and relate the accuracy of each isocenter's shift, statistical approaches such as standard deviations and two-tailed t-tests were performed. From this data analysis, it was concluded that an isocenter's cranial location did not have a statistically significant error in the ExacTrac's fusion software's algorithms.

## **NO P**

Andrew Gundersen, Enrique Hernandez, Ryne Quinlan (Dr. Haider Raad)

Department of Physics

Enrique Hernandez, Ryne Quinlan, and Andrew Gundersen, who are seniors in the Xavier Physics department, will be developing an electrically powered longboard with new, innovative features that promise to expand the small scale electric vehicle market to average consumers. The board, code named NoP, will possess a quad hub motor drive train. The deliverables of the board are separated into two categories called "guaranteed" and "stretch." Stretch deliverables are technologically viable, but not guaranteed given the time frame of the project. Guaranteed deliverables, as the name implies, have a high probability of completion by graduation. These include the drive system, a wireless controller, proof of concept brain machine interface, battery management system, and an acceleration of  $1.2\text{m/s}^2$  from 5-15mph. NoP will be broken-up into three main areas of engineering; these are mechanical (Andrew), electrical (Enrique), and computer (Ryne), with Andrew being the project manager. The project was chosen because it will serve as a useful stepping stone for learning about a fundamental technology (electric motors and batteries) that will be ubiquitous in the future.

### **HEAT LOSS UTILIZATION**

Alex Nahas, Ryan Caliguri (Dr. Haider Raad)  
Department of Physics

The US publisher Ward's estimates that as of 2010, there were 1.015 billion active motor Vehicles worldwide. In most cases the driving behind these vehicles is the combustion engine and for the foreseeable future, that is not going to change. The unfortunate reality of the combustion engine is that is incredibly inefficient in terms of power generated relative power used. This is predominantly due to heat loss. A system which could reduce this loss can create profound improvements to fuel economy. In addition, if widely adopted, the carbon footprint of vehicles would be reduced. Our team seeks to prove that a system can be put in place which utilizes this excess heat. We are creating a system which extracts the heat energy from the exhaust and converts it into electricity. This electricity can replace that which the engine would have work harder to generate thus improving the efficiency of the vehicle.

### **GOLF BALL SIMULATION AND AERODYNAMIC CHARACTERISTICS**

Eduardo Rivera Nicholls (Dr. Marco Fatuzzo)  
Department of Physics

The flight trajectory of a golf ball depends upon the net effect of gravity, lift, and drag. The latter two forces result from the complex interaction between the ball surface and the air through which it moves, and are characterized in terms of drag and lift coefficients that depend upon the geometry, speed and spin rate of the ball as well as the density of the air. Our research focused on using both wind-tunnel results and ANSYS software analysis to obtain reliable lift and drag coefficients for different flight condition and ball dimple-pattern, and use the results to inform a robust flight simulation MATLAB program.

### **EXPLORING HOW PROTEINS TUMBLE IN A SET ENVIRONMENT**

Riley Williams (Dr. Justin Link)  
Department of Physics

Proteins are involved in essential life giving processes and are found in every living organism. The structure of each protein helps determine its function, so many tools have been developed to characterize the proteins in various environments. Anisotropy is a technique that was invented in the 1950's and has been making increasing appearances in scientific literature over the decades. It uses polarized light to measure the rotational motions, or tumble, of fluorescent molecules. A protein with slower rotational motion will have a greater anisotropy value. Many factors affect the tumble of a molecule, including its size, shape, and the environment conditions. Found in proteins, tryptophan and tyrosine were placed in water at a dilute concentration. Glycerol was added to increase the viscosity of the solution and slow the spin. Results indicate that increasing the viscosity decreases the anisotropy, which was the opposite of the expected result.

### POLITICAL SCIENCE

#### **CHINESE PUBLIC OPINION ON THE US: INVESTIGATING THE ROLE OF POWER PERCEPTION IN US-SINO RELATIONS**

Zachary Arriaga (Dr. Mack Mariani)  
Department of Political Science

The literature surrounding current US-Sino relations has become increasingly prominent in the world political landscape in the past ten years. In his research on the Rise of China, Richard Wike proposes that the Chinese public progressively sees China taking a more powerful role in the world, and names the US as its top threat. Conversely, Wike suggests that the American public views China less favorably due to trade tariffs. Other theories on the poor state of US-China relations include arguments for ideological differences—authoritarian versus democratic—could lead to increased animosity. However, the aforementioned arguments have failed to address perceptions of power on the side of the Chinese public. This study addresses the extent to which the Chinese public views the US more negatively when the US is perceived to have greater power and influence, or if the Chinese public views the US more negatively because they perceive China to have greater power and influence.

### **COMPARING KIDS**

Megan Eckerman (Dr. Mack Mariani)  
Department of Political Science

The question of confidence in being elected based upon parental status is something that is not brought attention to in political science. The number of children a candidate has is not seen as a determining factor. I will be exploring the question of confidence in women to run based off the number of children they have, and how this has changed over time. My project fills this gap, examining the number of children comparably, to the gender of the representative. I will be examining this by looking at the Ohio General Assembly dataset, examining the gender of the representative with how many children that representative has. By doing this, I will be observing the correlation between the number of children and gender in order to reveal if an elected man is more likely to have a greater number of children than an elected woman. I argue that men have more confidence in being elected if they have more children, comparably women who have been elected are more likely to have less children. In conclusion, through closely examining current members and the number of children they have will lead to the determination of children being a factor to consider when considering confidence of running.

### **CONGRESSIONAL RELIGIOUS AFFILIATION AND ENVIRONMENTAL POLICY**

Noah Ruffin (Dr. Mack Mariani)  
Department of Political Science

Previous research suggests that there is a relationship between the demographic characteristics of US Congress members and the policy positions they take. The purpose of this study is to add to this literature by examining the specific relationship between Congressional religious affiliation and environmental policy. I hypothesize that in a comparison of members of the US Congress, those who identify as Roman Catholic will be more likely to support pro-environmental legislation than will Congress members who identify as any other religious affiliation. To test my hypothesis, I examine religious affiliation and environmental policy outcomes in the 115<sup>th</sup> (2017-2019) US House. I utilize data from the 2018 National Environment Scorecard published by the League of Conservation Voters and Congressional demographic data from CQ press. This project can show if there exists a meaningful difference between religions in Congress in their support for environmental policy action.

### **DOES THE UNITED STATES ASYLUM PROCESS NEED TO BE REVISED COMPARED TO ITS GLOBAL COUNTERPARTS?**

Eleanor Bjurman (Dr. Thomas Strunk)  
Department of Political Science

The global migration crisis shows no signs of abating, particularly in regards to the 3.1 million asylum seekers. In recent years, many Western nation-states have pursued strategies to hinder asylum seekers and limit their claims for protection. Although the issue of asylum is a productive area of migration scholarship, the bulk of research in the field is focused on various nation-states' determination processes and the international system's main measures of deterrence. I aim to expand the field of migration scholarship by assessing whether one particular state's model for refugee status determination is more effective than its neighbors. Specifically, I compare the effectiveness of U.S., Canadian, and Australian refugee policies based on data assessing refugee and migrants' integration success in the following nation-states. I posit that one state's determination process out of the three is more effective, especially with respect to holistic outcomes for asylum claimants. The conclusions drawn from this exploration will ultimately expand the dialogue on what a functioning and fair determination processes could like for all Western, industrialized nations.

### **GENDER PRESENTATION AND RHETORIC IN DEBATES**

Kaitlyn Clyne (Dr. Mack Mariani)  
Department of Political Science

Studying the gender presentation of candidates in Senatorial and Gubernatorial debates reveals the manner in which political leaders believe that voters understand and react to gender unconsciously. This paper examines the gendered rhetoric that candidates use in their campaigns as either feminine or masculine. This rhetoric presents itself in the form of campaign advertisements, speeches given by the candidates, the physical presence of the candidate, the political ideologies of the candidate, and the overall impression that

the mass media has of the candidate. For this project I chose to study the candidate debates because they provided a sustained experience of the ways that the candidate presented themselves, their abilities, and their political stances. Examining debates between candidates of different genders and of the same gender allowed for multiple scenarios. Each debate yielded a different result when examining how male and female candidates chose to be masculine and feminine, because performing gender often relies upon the gender of those around you. A male candidate may choose to present in a more masculine way if their opponent is a woman. A female candidate may choose to present in a more masculine way if their opponent is a man. Any combination of gender presentation could reveal itself and examining how these candidates used gender in their debates reveals how candidates feel their constituents will react to femininity and masculinity in the political arena.

### **GENTRIFICATION AND PROPERTY RIGHTS**

Grant Regan (Dr. Bradley Nestheide)  
Department of Political Science

Trying to evaluate what ought to be the aims of justice within any modern institution can be a daunting task. In this research, the modern economic phenomenon known as, gentrification is evaluated and argued for as a hindrance to fair and equitable citizenship, especially within the current democratic regime of the United States. Gentrification, is a process that relies on eminent domain, eviction and, rezoning occupying residents in an effort to appease upper-middle class aesthetic. This renewal of an urban landscape often creates economic and social inequalities for original inhabitants and those who seek to live there but can no longer afford the sky-rocketing cost of living. Thus, the primary comprehension of justice as fairness in this research is seen through the Rawlsian lens of property rights and ownership. This can best be examined by looking at our major urban epicenter's renewing zones and what dimensions of citizenry are entitled to a stake in a community in economic flux.

### **POLITICIANS TWITTER RESPONSE TO MASS SHOOTINGS**

Charles Quinn (Dr. Mack Mariani)  
Department of Political Science

Social media, in particular Twitter, has a pivotal role in how lawmakers can directly address their constituents in times of crisis. However, the subject of politician's tweets after a crisis vary. My presentation examines what type of tweets politicians send out after a common crisis in America, mass shootings. Specifically, in my project, I will be looking at the different subjects (policy tweet, condolence tweet, etc.) that Florida federal politicians tweeted in the immediate week following the Parkland High School shooting in February of 2018. In conclusion, this project will shed light on the nature of politicians' tweets during a time of crisis.

### **PRESIDENTIAL VOTE AND ATTITUDES TOWARD ABORTION, 1980-2016**

Heather Gast (Dr. Mack Mariani)  
Department of Political Science

Abortion and presidential candidates are two thoroughly divisive subjects in American culture. As the Democrat and Republican parties have allegedly grown more intensely partisan over the decades, I wondered whether attitude toward abortion played a substantial role in voter's presidential vote. I used Time Series data from American National Election Studies to evaluate the relationship between attitudes toward abortion among voters and presidential votes from 1980 to 2016.

### **SUSTAINING THE AMERICAN DREAM**

Christopher Harding (Dr. Mack Mariani)  
Department of Political Science

Lawmakers and scholars focus a tremendous amount of energy on eliminating barriers to access of housing instead of addressing the long-term struggles associated with homeownership. As a result, studies show that previous attempts to promote homeownership set up a majority of low income Americans for failure. This paper considers policies that promote sustainable homeownership while highlighting the need for more government investment in foreclosure prevention programs. Through analysis of emergency loan and

post mortgage counseling services, nuanced ways of creating sustainable homeownership for low income Americans are explored. Examining foreclosure prevention programs to promote sustainable homeownership in the United States offers a renewed call to address housing issues. The findings in this paper contend that investing in foreclosure prevention programs, on both the national and state level, adds to the resiliency of the housing market by mitigating the rate of foreclosures.

### **THE 2016 'INVINCIBLE PRIMARY'**

Samuel Green-Lauber (Dr. Mack Mariani)

Department of Political Science

The 2016 Democratic Presidential Primary has been one of the most consequential and tumultuous contests of electoral politics in recent memory. A particularly interesting aspect of the democratic presidential primary contest was the significance of the “invisible primary” otherwise known as the endorsement primary. It has long been fabled by political pundits and observers that the popular vote primaries are not actually the determiner of the party’s eventual presidential nominee, but instead that the party decides the nominee through backroom deals. According to this theory the “party elites” are who determines the winner of the primary. The party elites are described as being able to manipulate the results by providing favored candidates the support of important elements of the party such as through the endorsements of interest groups, and incumbent party officials. There hasn’t been a thorough enough examination of this theory by other political science scholars, and in this project It’s going to be important to use multiple different datasets to determine how effective the “party decides” theory was in the last major presidential election cycle, which was for this study is the 2016 democratic presidential primary. This project aims to study the results of that pivotal race and finally provide an answer to the question of the “invisible primary” and specifically whether this theory held true during the 2016 presidential primary on the democratic side.

### **THE FIGHT FOR 15: THE MINIMUM WAGE QUESTION**

Aidan Shea (Dr. Mack Mariani)

Department of Political Science

Over the past few years there has been a debate to whether or not raising the federal minimum wage to 15 dollars an hour would be a good idea or not. This project is attempting to see if higher minimum wages helped or hurt states economies, specifically in terms of unemployment, GDP per capita, overall GDP, and poverty rate. The hypothesis of this project is that states with higher minimum wages will produce better overall economies. The results of the project more so showed that economic growth or decline came from other factors that were not minimum wage. Since this is true it is likely that a \$15 federal minimum wage would not cause economic problems. This research was done while only 5 states have plans to or are actively pushing for the \$15-dollar minimum wage, therefore future research on this topic is highly recommended.

### **THE ONGOING IMPACT OF 9/11**

Colin Cooper (Dr. Mack Mariani)

Department of Political Science

The September 11<sup>th</sup> attacks of 2001 were some of the most monumental moments in both American and world history. The terrorist’s attacks which left almost 3,000 people dead, as well as countless deaths in the following years, have left an unimaginable impact on the world. This impact has been seen most in the news media, as coverage of the attacks still continues to this day. This news coverage covers almost all topics in society. Some of these issues, just to name a few, include international security, physical and mental health issues, and U.S. foreign policy. In this presentation, I will be demonstrating the ongoing impact that 9/11 has had on the news media and coverage community. Through the collection of various forms of media coverage, I have created a dataset that shows the ongoing impact that 9/11 has had on our society. In most cases, people are not aware of lasting effects that 9/11 has had (and will continue to have) on their daily life. Local, state, and national policy have all been strongly dictated by the events that occurred 19 years ago, and will continue to do so in the future. Through this presentation, I aim to inform my audience of the everlasting impact that 9/11 has had on our society.

## **THE RESTAURANT CLEANLINESS EFFECT ON DEMOGRAPHICS**

Joseph Ortiz (Dr. Mack Mariani)  
Department of Political Science

Humans have always found communities between each other. We may not live in tribes but we can pick what kind of current modern tribe we want to be a part of. It is easier now than ever to choose where you want to live and what kind of neighborhood to settle yourself in. Scholars have recently studied the effect of food deserts within communities and how unhealthy families are living in the area due to lack of nutrients in the grocery stores. One scholar such as Hugh Semple in his book "*The Evolution of Food Deserts in a Small Midwestern City: The Case of Ypsilanti, Michigan: 1970 to 2010*" has researched and analyzed food desert throughout his career. In this book, he discovers food deserts in urban areas and their unending trapped cycles. In my research project, I will be taking it a step further and looking at zip codes in the Travis county area or the Austin, Texas region and analyzing their demographics such as ethnicity, wealth, and many more variables. From there, I will argue that food desert neighborhoods' restaurants have better health inspection scores than affluent communities since food desert communities go out to eat more than cooking at home. In conclusion, I hope this project will shed new light into proving stereotypes of poor neighborhood restaurants to be false.

## **WHY DO PEOPLE AGREE OR DISAGREE WITH ABORTION**

Kayla Curtin (Dr. Mack Mariani)  
Department of Political Science

Abstract: The question of whether abortion has become more of a gender issue or a party issue has been widely debated within the last few years, with many scholars considering it a gender issue. However, these perspectives have not adequately addressed the issue of political party affiliation. My project compares how strong party affiliation and gender correlates with feelings towards abortion. Specifically, in my project, I will be looking at the Pew Research Center in order to reveal the previously misunderstood connections between what kind of an issue abortion is. In conclusion, this project, by closely examining both party affiliation and gender, will shed new light on how abortion is viewed, either by gender or by party affiliation.

## PSYCHOLOGY

### **DOES THE RACE OF AN AGGRESSOR AND VICTIM AFFECT THE PERCEIVED FAIRNESS AND ACCEPTABILITY PUNISHMENT FOR TRANSGRESSIONS**

Tyeshia Smith (Dr. Tammy Sonnetag)  
Department of Psychology

Race, a social construct, is used to categorize individuals by skin color, and is associated with stereotypes and prejudices that affect how people of different races are treated. The current study was designed to examine if racial prejudice may explain if the perceived fairness and acceptability of a punishment following a transgression is affected by the race of an aggressor (i.e., Black, White, or Unspecified) and race of a victim (i.e., Black or White). Participants included 107 students, recruited through the participant pool in the School of Psychology at Xavier University, who ranged in age from 18-25 ( $M = 19.67$ ,  $SD = 1.22$ ). The study was conducted as a 3 (Race of Aggressor: Black, White, Unspecified) x 2 (Race of Victim: Black or White) between-subjects design, where participants were randomly assigned to read one of six case files describing a student aggressor leaving a victim with a black eye. The case files also described that the student aggressor was expelled as a result of the altercation. Participants then completed measures assessing their perceptions of the fairness and acceptability of the punishment. Results revealed that participants perceived the punishment as fairer and more acceptable when the aggressor was White or his race was Unspecified compared to when the aggressors was described as Black. Also, the punishment was perceived as fairer and more acceptable when the victim was described as Black rather than White.

## **DOES TYPE OF ABUSE AFFECT PERCEPTIONS OF A PERPETRATOR'S GENDER**

Katherine Pfeifer (Dr. Dalia Diab)  
Department of Psychology

This study examined college students' perceptions of a perpetrator's gender based on different types of abuse: physical, sexual, and emotional/verbal abuse. It was hypothesized that college students would perceive males as more likely than females to be perpetrators of all three types of abuse. A total of 83 participants (37.3% male and 62.7% female) read a vignette depicting physical, sexual, or emotional/verbal abuse. They answered a three-item dependent variable measure, which consisted of 2 items asking the participants to rate the extent to which they agreed or disagreed with whether the perpetrator was male or female, and 1 question asking them to indicate if they thought the perpetrator was male or female. Then, participants completed a manipulation check, as well as a demographics form that included optional questions about participants' different personal experiences with abuse in addition to other demographic items (e.g., gender). Results indicated no significant differences among the conditions for the items "The Perpetrator is Male" and "The Perpetrator is Female" in the dependent variable measure. Regarding the final item (i.e., "Based on what you read, do you believe the perpetrator is male or female?"), there was also no significant difference in the likelihood of selecting the perpetrator as male or female based on different types of abuse. Specifically, as hypothesized, participants chose males more frequently than females as the perpetrator regardless of the type of abuse.

## **EFFECTS OF DISCLOSURES ABOUT INVISIBLE DISABILITIES ON INTERPERSONAL STIGMATIZATION**

Alyanna Reick-Mitrisin (Dr. Tammy Sonnentag)  
Department of Psychology

Individuals hold negative attitudes towards those whose appearance or behavior is perceived to be deviant or deficient (Puhl & Latner, 2007), including negative attitudes toward peers who stutter (Davis, Howell, & Cook, 2002) or have physical disabilities (Nowicki & Sandieson, 2002). However, less research has examined individuals' attitudes towards peers who have "deviant" characteristics that are not directly visible or observable. These unobservable characteristics reflect "invisible disabilities," which are disorders or conditions that cannot be seen by looking at an individual (e.g., chronic pain). Of the studies that have examined invisible disabilities, results reveal that disclosing such disabilities is harmful (e.g., Hipes, Lucas, Phelan, & White, 2016). However, little existing research has examined the extent to which disclosures related to invisible disabilities (e.g., affiliating with or advocating for organizations that support invisible disabilities) affect interpersonal outcomes. The current study examined if disclosing an affiliation (e.g., society or club membership) with an invisible disabilities is enough to elicit interpersonal stigmatization, even if an individual does not him/herself have an invisible disability. The study was conducted as a 2 (Disclosure of Invisible Disability Club Participation: Yes, No) x 2 (Disclosure of a Disability: Yes, No) between-subjects experimental design. Sixty participants read one of four applications to a university-related service trip, where the student-applicant was or was not affiliated with an invisible disabilities club and did or did not disclose possessing an invisible disability (i.e., depression and anxiety). Participants then completed measures assessing the extent to which they would stigmatize the applicant (i.e., engage in social distancing, and have negative impressions). Results revealed that participants stigmatized students who disclosed their affiliation with an invisible disabilities club less than students who had no affiliation with an invisible disabilities club, but this stigmatization was not heightened when student applicants disclosed possessing an invisible disability themselves.

## **EFFECTS OF POLITICIANS GENDER AND APOLOGIES ON PERCEPTIONS OF SCANDAL**

Paige Hubbard (Dr. Christian End)  
Department of Psychology

This study deals with how the politician's gender and response to a scandal changes the participant's perceptions. From previous research it was hypothesized that female politicians would be rated worse than male politicians. There was also the hypothesis that the denial condition would be the worst perceived and the no apology condition would be the best perceived across genders. Using a vignette detailing the mismanagement of funds the researcher measured: first impression, value of response, and trust in government. Despite previous research, results indicated that there is no significant difference in perceptions based on gender. The denial condition was perceived the best across the first impression and response measures and the apology condition was perceived the worst. There was little change in the participants' trust in government across the

conditions. Results were discussed in regards to self-report measures, 2017 political climate, and generalizability of participants' results.

### **EFFECTS OF WARNING LABELS ON EDITED PHOTOS POSTED ON INSTAGRAM: IMPACTS ON FEMALES SELF-ESTEEN, SELF-WORTH, AND APPEARANCE-RELATED SATISFACTION**

Emily Tenkman (Dr. Tammy Sonnetag)  
Department of Psychology

Posting content on social networking sites (SNSs), editing photos, and engaging in social comparison behaviors are common practices among female adolescents in today's society. Nearly half of the 1,710 participants sampled in a recent study, conducted by the Renfrew Center Foundation (2014), reported editing photos of themselves in some way prior to posting on SNSs. Further, exposure to highly edited photographs on SNSs leads individuals to experience negative self-evaluations (McLean, Paxton, Wertheim, & Masters, 2015), yet little research has examined ways to mitigate the impact that photo-editing (and social comparison behaviors) may have on individuals' self-evaluations (Chae, 2017). The current study investigated if presenting explicit warning labels on highly edited SNS photos affects females' self-esteem, self-worth, and appearance-related satisfaction. Female undergraduates ( $N = 74$ ) aged 18-22 ( $M_{age} = 19.45$ ,  $SD = 1.04$ ), who all reported having at least one SNS, were randomly assigned to one of four SNS (i.e., Instagram) photo conditions, reflecting a 2 (Photo Type: Unedited, Edited) x 2 (Presence of a Warning Label: Yes, No) between-subjects design. After exposure to an Instagram profile, participants reported their self-esteem, self-worth, and satisfaction with their appearance. Although highly edited photos did not affect females' self-esteem, self-worth, and appearance-related satisfaction, participants reported higher self-esteem and greater satisfaction with their appearance when photos included a warning label (compared to photos without a warning label). Implications for the role of warning labels or disclaimers on highly edited photographs posted on SNSs will be discussed, including how warning labels on edited photos may promote healthier experiences on SNSs.

### **HUMAN-ANIMAL INTERACTION REDUCES STRESS AND INCREASES POSITIVE MOOD**

Molly Radcliff (Dr. Dalia Diab)  
Department of Psychology

Previous research on human-animal interaction has illustrated that students experience significant reductions in anxiety and negative affect as well as increases in positive affect after interacting with a dog (Crossman, Kazdin, & Knudson, 2015). The current study extends previous research by examining the effects of interaction with a dog on students' levels of anxiety, mood, and self-disclosure. A total of 84 undergraduate students rated their anxiety, mood, and willingness to self-disclose personal information to a close friend after one of three conditions: interacting with a dog, viewing a video of that same dog, or reading an informational article about the origins of dogs. Participants completed an anxiety induction task in which they wrote about a past situation which made them feel anxious, their condition task, and seven surveys. Results revealed that participants expressed lower levels of anxiety and higher levels of positive affect in the dog interaction condition than the other two conditions. There were no significant differences in willingness to self-disclose between any of the conditions. The findings suggest that human-animal interaction, such as animal-assisted therapy, can be beneficial to the mental and emotional well-being of undergraduate students.

### **LIKELIHOOD OF FORGIVENESS FOLLOWING A TRANSGRESSION WITH OR WITHOUT A SINCERE APOLOGY**

Jaclyn Fahey (Dr. Tammy Sonnetag)  
Department of Psychology

Forgiveness is defined as a "motivational transformation that inclines people to inhibit relationship-destructive responses and to behave constructively toward someone who has behaved destructively toward them" (McCullough, Worthington, & Rachal, 1997, p. 321). Although much research demonstrates that forgiveness promotes positive *intrapersonal* outcomes, such as reduced anxiety, depression, and anger (Gassin, 1994, as cited in Weiner, Graham, Peter, & Zmuidinas, 1991), less research has demonstrated if *interpersonal* factors affect the likelihood of forgiveness. The current study examines if two interpersonal factors affect the likelihood that a relationship-destructive behavior (i.e., interpersonal transgression) is forgiven: 1) *power dynamics* between the transgressor and the victim and 2) the *sincerity of an apology* offered by the transgressor. Because previous research suggests that a sincere, or "full-blown apology" (which involve

a confession, self-reprimand, and offer of restitution) is more likely to be forgiven than a less sincere apology (Holtgraves, 1989), it is possible that the sincerity of an apology may promote forgiveness regardless of a transgressor's position of power in a relationship. The study was conducted as a 2 (Power Dynamics: Transgressor has Power vs. Victim has Power) x 2 (Apology Sincerity: Sincere vs. Not Sincere) between-subjects design. After reading a vignette describing the relationship dynamics between two friends, where one is described as possessing more "power" in the relationship, participants were given a screenshot of a website (i.e., Yik Yak) where harmful gossip about one of the friends was made public. Participants read a text message conversation between the two friends where the victim confronts the transgressor and is offered a sincere or insincere apology. All participants then answered questionnaires measuring their perceptions that the victim will forgive the transgressor. Results revealed that when a victim had more power in a relationship, participants' perceived greater likelihood of forgiveness in response to a sincere apology than an insincere apology. However, when the transgressor had more power in a relationship there was no difference in participants' perceptions of forgiveness in response to sincere or insincere apologies.

### **PERCEIVED CREDIBILITY OF FEMALE SPORTS BROADCASTERS IN MALE AND FEMALE SPORTS**

Sara Rojas (Dr. Tammy Sonnentag)  
Department of Psychology

Despite the constant fight for the equality of men and women, and the presence of laws preventing gender-based discrimination, males still vastly outnumber females employed in the sports industry (Biernat & Vescio, 2002). One potential explanation for the higher rate of employment of males, compared to females, in the sport industry is that males are perceived to be more knowledgeable about sports and, therefore, more credible than females. To understand if perceived credibility is a factor affecting males' and females' acceptance in the sports industry, the current study examined whether female broadcasters are perceived as less credible when commentating on a sport, such as soccer, compared to male broadcasters. Further, the current study examined if the perceived credibility of the broadcasters depended on the gender of the athletes (i.e., male or female sports). A total of 65 undergraduate students were randomly assigned to one of four conditions where they watched a 2-minute video, of either a female or male soccer game, where a female or male commentator interpreted and analyzed the plays during the game. Participants were led to believe that the video reflected an audition for an entry level job as a commentator for the United Soccer Minor League. After viewing one of the videos, participants responded to questionnaires assessing their perceptions of the trustworthiness (Lombardi, Sevrastian, & Sinatra, 2014) and credibility (Jin, Cheung, Lee, & Chen, 2009) of the broadcasters. Separate 2 x 2 between-subjects ANOVAs were conducted with perceived trustworthiness and credibility as the dependent variables. Results revealed that the broadcasters' comments were perceived as more credible for female ( $M = 4.07$ ,  $SD = 1.02$ ) than male sports ( $M = 3.40$ ,  $SD = 1.42$ ),  $F(1, 61) = 4.18$ ,  $p < .05$ . Contrary to expectations, there was no difference in the perceived credibility of male or female broadcasters, regardless of whether they commented on male or female sports. Given the scant research on the perceived credibility of sports broadcasters, the current study contributes to the literature on how gender of the broadcasters and gender of the sport may influence viewers' perceptions of televised sports. Implications of the current work, including directions for future research examining gender differences in sports (e.g., "prestige" of a game; season vs. playoff game) will be discussed.

### **PERCEIVED SIMILARITY OF AUTISM AS A FACTOR AFFECTING STIGMA**

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The present study examined if college students perceive themselves as similar or dissimilar to individuals with autism spectrum disorders (ASD), and if their perceived similarity affects stigma towards individuals with autism. Participants completed a Characteristics Scale that evaluated how strongly participants identified with each characteristic. Participants in the primed group watched an Asperger's Syndrome video that displayed identical characteristics to those participants previously rated. The characteristic scale primes participants to identify similarities between themselves and individuals with ASD while viewing the Asperger's syndrome video. Participants then completed a Social Distance Scale used to assess their stigma towards individuals with ASD and an ASD knowledge questionnaire. The results indicated that participants primed to identify similarities between themselves and individuals with ASD reported no significant difference in stigma compared to participants who were not primed,  $t(53) = 1.66$ ,  $p = .104$ . Participants in the primed group and control group reported no difference in knowledge of ASD,  $t(51) = 0.99$ ,  $p = .328$ . Overall, participants reported less stigma towards individuals with ASD regardless of priming condition, and participants reported less

knowledge about ASD. In addition, increasing knowledge and decreasing misconceptions about ASD may allow more opportunities for individuals to befriend those with ASD on college campuses, and may help the growing number of individuals with ASD who are entering a college community and/or the work force face less stigma.

### **PERCEPTIONS OF ATHLETES LEADERSHIP**

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Task leadership is one of the most studied topics related to athletic leadership (Longhead, Hardy & Eyes, 2006). In a sports setting, task leadership is defined as a willingness to make decisions, give directions to teammates, and generally take control of the team (Fransen, Vanbeselare, DeCuyper, Broek & Boen, 2014). Athletic leadership can be categorized as being formal or informal (Longhead, et al., 2006). Male and female athletes are constantly acting in leadership roles, both formally and informally, however the sports fan's perception of task leadership is unclear and necessitates further study. The present study will examine gender differences in relation to formal and informal leadership in a sports setting. Although task leadership has been studied in a sports setting, a comparison of the perceptions of formal and informal leadership has on informal leadership is lacking. Formal and informal leadership will be manipulated through the title that is used when referencing the athlete in the vignette. In the formal condition "captain" will be used to describe an athlete-leader, whereas in the informal condition "non-captain" and "team member" will be used to describe the athlete-leader. Furthermore, the athlete-leader's gender will be manipulated by the use of a stereotypical male and female name. Consistent with previous research that indicates females are often stereotyped as ineffective leaders (Brown, 1979), researchers hypothesize the male athlete will be perceived as a more credible leader than the female athlete in both the informal and formal conditions. Undergraduate students ( $N=140$ ) will be randomly assigned to read one of four vignettes describing an athlete's leadership. These four vignette categories include an interaction between a soccer team and either a female team captain, male team captain, female team member, or a male team member. After reading the vignette, participants will complete a Modified Manager Evaluation (Aguinis & Adams, 1998) that assesses credibility. Following data collection, a two way ANOVA (gender x leadership type) will be performed on the total score of the Modified Manager Evaluation. The presence of a main effect of gender, assuming the difference is in the direction hypothesized, will confirm the hypothesis. Although not expected, if there is an interaction effect, post hoc *t*-tests will be used to examine this interaction. The present study received IRB approval and data collection concluded in December 2018.

### **TAKING THE PERSPECTIVE OF A STUDENT WITH ANXIETY**

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Previous research has demonstrated that individuals with a concealable stigmatized identity (e.g., depression, anxiety) experience negative health consequences the more they actively attempt to conceal the identity from others (Quinn, Weisz, & Lawner, 2017). Although people with a stigmatized identity conceal their identity to avoid perceived devaluation from others (Clair, Beatty, & MacLean, 2005), research suggests that individuals with a stigmatized identity can attempt to "protect themselves from devaluation" by engaging in one of two self-regulatory strategies: promotion focus, which involves attempts to promote a positive image; and prevention focus, which involves attempts to prevent a negative image (Newheiser, Barreto, Ellemers, Derks, & Scheepers, 2015, p. 796). Recent research has revealed that hiding a stigmatized identity while promoting a positive image (i.e., promotion focused) rather than preventing a negative image (i.e., prevention focused) leads non-stigmatized peers to perceive the interaction more positively. The current study attempts to extend this research by examining if understanding or taking the perspective of an individual who conceals a stigmatized identity using promotion- or prevention-focused strategy impacts perceptions of the stigmatized individual. The study was conducted as a 2 (Concealment Focus: Promotion vs. Prevention) x 2 (Relationship: Faculty vs. Peer) between-subjects design. Participants were randomly assigned to one of the study's four conditions where, by watching a video, they took the perspective of a student with anxiety. The student with anxiety used a promotion- or prevention-focused strategy while talking with a faculty or peer. After watching a video, participants completed measures assessing their perceptions of and anticipated affective reactions toward the individual with anxiety. Results revealed that participants reported more positive (but not less negative) affect in response to promotion compared to prevention focused concealment. Participant also reported more negative affect after interactions with peers than faculty. Future research might also consider examining

actual interpersonal interactions, where perspective taking occurs, to examine individuals' authentic responses.

## **HOW LABELS AFFECT PERCEPTIONS OF PEOPLE WITH VISIBLE OR NON-VISIBLE INTELLECTUAL DISABILITIES**

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Approximately 6.5 million people in the United States (U.S) have an intellectual disability (Special Olympics. 2018). Despite intellectual disabilities being the most common type of disability in the U.S., there are still many stereotypes about and great stigmatization associated with having an intellectual disability. Stereotypes of individuals with intellectual disabilities include beliefs that these individuals are dangerous and incompetent, and these stereotypes lead people with intellectual disabilities to experience ostracism and rejection (Cutler & Ryckman. 2018). Recent research has examined ways to decrease people's stigmatizing attitudes toward individuals with intellectual disabilities (Clement et al., 2015; Corrigan. 2004; Eisenberg, Golberstein & Gollust 2007). One way that researchers suggest to decrease the stigmatization of individuals with intellectual disabilities is to reduce the use of labels. Although labels may serve a diagnostic purpose (American Psychiatric Association., 2007), the labels are frequently used in a negative manner in everyday language. Specifically, possessive labeling, which involves defining a person as having a disorder (e.g., Jessica *has* delusional disorder), promotes more stigmatization than not using a label (Culter & Ryckman. 2018). Consequently, the purpose of the current study is to examine if possessive labels increase individuals' negative stigmatization of and social distancing from peers with an intellectual disability, particularly when the disability is physically visible. It was predicted that when an intellectual disability is visible in the appearance of a student, participants will report more stigmatization and greater social distance than when the disability is not visible. Further, it was predicted that possessive labels would lead to more stigmatization of and greater social distancing from a student with an intellectual disability than no label. Finally, it was predicted that possessive labels were expected to yield more stigmatization of and greater social distancing from students with an intellectual disability, and this would be especially true when the disability was physically visible. The study was conducted as a 2 x 2 between subject's experimental design. Participants were randomly assigned to one of four conditions, where they read a newswire article about a student who was or was not identified (i.e., labeled) as having an intellectual disability, and shown an accompanying picture of the person or not. Participants then completed measures of their stigmatization of and likelihood to social distance themselves from the disabled student. Results revealed that neither labeling a student with a disability nor making the disability physically visible affected individuals' stigmatization of or willingness to interact with the student with a disability. The present findings suggest that undergraduate students perceive peers with intellectual disabilities rather positively, and the labels used to describe intellectual disabilities do not affect perceptions, even when the disability is physically visible.

## **PRE-VERSUS POST-LEARNING STRESS ON MEMORY**

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Learning emotional information may be impacted by stress. Research has shown that being stressed before learning emotional material enhances memory of that material (Domes, Heinrichs, Reichwalk, & Hautzinger, 2002; Nater et al., 2007; Smeets, Giesbrecht, Jelicic, & Merckelbach, 2007). Research has also shown that being stressed after learning emotional material enhances memory of that material (Cahill, Gorski, & Le, 2003; Cahill & McGaugh, 1998; McGaugh, 2000). However, no studies have directly compared the effect of pre-versus post-learning stress on memory of emotional information. The present study compares the effect of stress before learning emotional information versus the effect of stress after learning emotional information. Participants watched a horror clip shortly before (pre-learning) or after (post-learning) studying a list of high arousing, low arousing, and neutral words. Participants in the control condition watched a neutral video clip before learning the list of words. All participants then completed a filler task for 45 min after which they recalled as many words as they could remember. A one-way ANOVA indicated no differences in the total words recalled between each condition,  $F(2, 86) = 0.17, p = 0.84$ . Furthermore, one-way ANOVA's indicated no difference between the conditions and number of high arousing words recalled,  $F(2,86) = 1.20, p = 0.31$ , and number of neutral words recalled,  $F(2, 86) = 0.03, p = 0.97$ . However, a trend was found between the conditions on the number of low arousing words recalled,  $F(2,86) = 2.48, p = 0.09$ . Participants in the control condition recalled more low arousing words compared to participants in the stress conditions suggesting that high levels of stress may inhibit memory of low arousing words. Although a trend was found, it is still

unknown whether pre-or post-learning stress for emotional information has a greater effect on memory. Future research should continue to study the effects of pre-versus post-learning stress on memory to better understand how memory can be impacted by stress.

### **SOCIAL AND MORAL ACCEPTABILITY OF TAKING ANOTHER STUDENT'S ADHD MEDICATION DURING URGENT AND NON-URGENT ACADEMICALLY IMPACTFUL SITUATIONS**

Taylor Wilkinson (Dr. Tammy Sonnetag)  
Department of Psychology

Since ADHD has become increasingly common on college campuses, there has been an increase in the presence of stimulant medications (Sepulveda, Thomas, Cranford, Boyd, & Teter, 2011). Recent research demonstrates that, "11% of subjects with ADHD [have] diverted (sold) their medication, 22% took too much or misused their prescribed medication, and 10% got 'high' on their medication" (Wilens, Gignac, Swezey, Monuteaux, & Biederman, 2006, p. 411). Additional research has revealed that of 381 individuals surveyed from a mid-western university, 43.8% reported knowing other students who illegally used stimulant medications and 22.3% of the students agreed that stimulant medications were currently being abused on their campus (Hall, Irwin, Bowman, Frankenberger, & Jewett, 2005). Misusing stimulant medications is associated with health-related concerns, such as decreased appetite, insomnia, irritability, headaches, and stomachaches (Advokat, Guidry, & Martino, 2008), as well as academic concerns. For example, according to Gallucci, Martin, Hackman, and Hutcheson (2016), of the participants in their study who engaged in the misuse of prescription stimulants (MPS), they reported engaging in academic dishonesty more often than the participants who did not engage in MPS. Also, students who reported having a lower grade point average (GPA) were more likely to engage in the MPS than students with a higher GPA. Given the negative health and academic outcomes associated with MPS, the present study examined undergraduate college students' perceptions of when it is socially and morally acceptable to use another student's ADHD stimulant medication in both urgent and non-urgent situations with low and high stakes in academic consequences. The study was conducted as a 2 (Academic Planning: urgent, non-urgent) x 2 (Outcome Severity: high stakes, low stakes) between-subjects factorial design. Fifty-eight students, attending Xavier University and enrolled in psychology courses were assigned to one of four conditions where they read a vignette describing a student taking another student's ADHD stimulant medication because of their lack of preparation for a 10-point quiz or a 100-point exam, which was either the next morning (an urgent academic situation) or the following week (a non-urgent academic situation). After reading the vignette, participants responded to a questionnaire assessing their perceptions of the moral acceptability of using another student's ADHD stimulant medication. Results revealed that using another student's prescription stimulants was perceived as more morally acceptable in high stakes compared to low stakes situations, but this effect did not depend on whether the assigned was urgent.

### **SOCIAL INCLUSION OF AMERICAN AND JAPANESE INTROVERTS IN EXTROVERTED SOCIAL SITUATIONS**

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In the United States (U.S.), extroversion is valued relative to introversion; the tendency to value extroversion compared to introversion (especially in social situations) is called the "Extroverted Ideal" (Cain, 2012). The Extroverted Ideal reflects the belief people characterized as "gregarious, an alpha, and [being] comfortable in the spotlight" (p. 5) are highly valued. Because the U.S. reflects an individualist culture and appears to value gregarious people who are comfortable in the spotlight (Cain, 2012), it is possible that less extroverted (i.e., introverted) individuals experience heightened rejection in social settings that require extroverted qualities. Previous research has demonstrated that individuals are less likely to socially exclude others perceived as similar to themselves and more likely to socially exclude individuals who are perceived as different (Peplak et al., 2017). Consequently, there is a need to examine if the inclusion or exclusion of individuals from social settings depends on the degree to which their perceived personality is valued. The current study examined undergraduate students' willingness to socially include introverted individuals, from two countries that value introversion differently, in social situations requiring increasing needs for extroversion. One hundred and fifty-one students were randomly assigned to one of six conditions, reflecting a 2 (Country of Origin of Student: U.S., Japan) x 3 (Need for Extroversion: Low, Moderate, High) between-subjects design. Participants read a vignette describing an introverted individual who was invited to participate in a socially-interactive board game involving 4, 8, or 16 players. Participants then completed a series of questionnaires measuring

their perceptions of the introverted individual's likelihood of being socially included, the introverted individual's self-perceptions, and the introverted individual's perceived social anxiety. Interestingly, and counter to expectations, results revealed that Japanese individuals ( $M = 4.81, SD = 0.77$ ) were perceived to be more likely to be socially included than American ( $M = 4.35, SD = 1.12$ ) individuals  $F(2, 145) = 3.01, p = .05$ , but this effect was not moderated by the need for extroversion in the social situation. No effects emerged for participants' perceptions of the introverted individual's self-perceptions or social anxiety. Implications for the current findings will be discussed, including a discussion of extroverted social situations where introverts may thrive.

### **STUDENTS' PERCEPTIONS OF GPA AND PERSONALITY IN HIRING DECISIONS**

Riley Varney (Dr. Christian End)  
Department of Psychology

The current study examines students' perceptions of job candidate characteristics, specifically grade point average (GPA) and personality traits, and how the traits impact hire-ability. Participants ( $N=113$ ) were given a letter of recommendation describing a job candidate with a high or low GPA and more or less desirable personality traits. Participants then completed a hire-ability scale, an impressions ratings scale, and a characteristics ratings scale. The hypothesis was disconfirmed, and there was a main effect of GPA. Future research should compare different factors and present those factors through another form.

### **TECHNIQUES TO IMPROVE SUPERVISOR- EMPLOYEE RELATIONSHIPS**

Michelle Rowekamp (Dr. Christian End)  
Department of Psychology

With employee turnover rates increasing and job satisfaction rates decreasing in the workforce, it is necessary to find a way to keep employees satisfied in their work (Luthans, 2000). Previous research indicates that non-financial related rewards (e.g. recognition) can be just as motivating as a cash reward for a job well done (Luthans, 2000). What is unknown is when a supervisor recognizes an employee, do gender differences regarding satisfaction with a supervisor exist among employees? By identifying what male and female employees find motivating in the workplace, supervisors can direct specific preferred non-financial rewards to their employees based on their gender. The present study examined the interaction between the employee's gender and supervisor tendency to recognize performance on satisfaction with a supervisor. It was hypothesized when recognized by the supervisor, participants would report higher satisfaction with their supervisor than when they were not recognized by the supervisor. Additionally female participants would report greater satisfaction with the supervisor when recognized compared to male participants. Undergraduate students ( $N=139$ ) were randomly assigned to read one of two vignette categories regarding an interaction with a supervisor. The two vignette categories included a supervisor who recognized an employee after a presentation or a supervisor who withheld recognition. Participants read the vignette and completed a modified Satisfaction with Supervision Index (Noelker, Ejaz, Menne & Bagaka, 2009) evaluating satisfaction with a supervisor. Following data collection, a two-way ANOVA (participant's gender x recognition behavior) was conducted on the total score of the modified Satisfaction with Supervision Index. The two-way ANOVA yielded a main effect for the vignette the participant was assigned to read,  $F(1, 135) = 22.92, p < .05$ , such that satisfaction with supervisors was significantly higher when the supervisor recognized an employee after a job-related task ( $M = 22.69, SD = 3.02$ ) than when the supervisor did not recognize the employee ( $M = 19.58, SD = 4.36$ ). The main effect of the employee's gender was not significant  $F(1, 135) = .02, p = n.s.$  The interaction effect was also not significant  $F(1, 135) = .46, p = n.s.$  These findings indicate there is no significant difference in how men or women perceive a supervisor who recognizes their employees. The results do, however, give further support to Luthan's (2000) study demonstrating the influence of recognition on satisfaction with a supervisor. Researchers should explore predictors of satisfaction, besides gender, so supervisors can match motivational strategies to employee reference.

### **THE DISNEY PRINCESS INFLUENCES ON BODY SATISFACTION IN YOUNG ADULTS**

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Department of Psychology

The current study examined how exposure to Disney Princesses could influence body image satisfaction in young adults. It was predicted that a female's exposure to Disney Princess films would result in greater body

image dissatisfaction. It was also predicted that a male's exposure to Disney Princess films would result in greater body image satisfaction. Eighty participants were randomly assigned to either a Disney Princess film group or to a Disney Animal film group. Participants completed a Media Consumption form. Next, participants watched either three, 10-min Disney Princess or Disney Animal film clips. Participants completed a movie questionnaire while watching the film clips to help remain attentive. Afterwards, participants completed the Body Image Concern Inventory (BICI), a demographic form, and were debriefed. A 2 x 2 analysis of variance was conducted using the BICI scores as the dependent variable and the Disney film groups and gender as the independent variables. There was a main effect of gender due to females ( $M = 52.19$ ,  $SD = 10.83$ ) reporting higher BICI scores than males, ( $M = 37.26$ ,  $SD = 7.95$ ),  $F(1, 74) = 45.58$ ,  $p < .001$ . There was no main effect of Disney film group,  $F(1, 74) = .66$ ,  $p = .42$ , and no significant interaction between gender and Disney film group on BICI scores,  $F(1,74) = .005$ ,  $p = .94$ . A negative correlation was found between participants' body image satisfaction and how frequently participants watched Disney Princess films as a child,  $r(76) = -.264$ ,  $p < .05$ . The correlation indicated that participants who watched Disney Princess films as a child were less likely to experience body image dissatisfaction as a young adult. The results of the current study indicated that exposure to Disney Princess films does not negatively influence body image in young female and male adults. Future research should employ longitudinal studies to determine how consistent exposure to Disney Princess films may influence children's body image in the long term.

### **THE EFFECT OF KNOWLEDGE ON STIGMA AND BLAME OF MENTAL ILLNESS**

Julia Fabrizi (Dr. Tammy Sonnentag)  
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Previous research has demonstrated that individuals with mental illness are often perceived as incompetent, irresponsible, dangerous, unpredictable, or to blame for their illness (Wahl et al., 2002). In fact, when people are asked to describe individuals with mental illness, the majority use negative, stereotypical, or inaccurate language (Rose, Thornicroft, Pinfold, & Kassam, 2007). Research suggests that increasing education and awareness about mental illness has the potential to reduce stigmatization and hindrance to help-seeking (Hugo, Boshoff, Traut, Zungu-Dirwayi, & Stein, 2003). The current study examined whether people's knowledge of mental illness affects how they perceive (i.e., if they blame or stigmatize) those with mental illness who may or may not be seeking treatment. A total of 90 participants were randomly assigned to one of the study's four conditions in which a random half of participants were assigned to read an educational flyer containing facts and statistics about mental illness (treatment). Participants then read one of two vignettes describing someone with mental illness who either did or did not receive treatment. All participants then completed questionnaires assessing their attributions of blame and stigma toward individuals with mental illness. Results revealed that providing participants' knowledge of mental illness made no significant difference in participants' attributions of stigma and blame toward individuals with mental illness, regardless of whether the individual was or was not seeking treatment. Because individuals in society may be insensitive to and lack understanding of mental illness (treatment), the current study may demonstrate how more positive (or less negative) perceptions of mental illness can be pursued.

### **THE EFFECT OF MORAL RELATIVISM ON DISCOUNTING THE MORALITY OF INGROUPS AND OUTGROUPS**

Azl Saeed (Dr. Tammy Sonnetag)  
Department of Psychology

Research suggests there are two philosophical positions from which individuals view morality: absolutism and relativism (Rai & Holyoak, 2013). Absolutism holds that some moral beliefs and behaviors are objectively true (i.e., always right or always wrong), whereas relativism holds that some moral beliefs and behaviors depend on context (i.e., are not always right or wrong). Interestingly, previous research has demonstrated that individuals who hold a moral relativism view engage in more immoral behaviors compared to individuals who hold a moral absolutism view (Rai & Holyoak, 2013). Furthermore, individuals' moral perspective impacts their perceptions of the moral status of an act (Goodwin & Darley, 2012), with individuals endorsing moral relativism assigning less blame to others for moral offenses compared to individuals endorsing moral absolutism (Forsyth, 1980). Given this literature, the current study examines if moral views can help explain the common finding that outgroup members' (im)moral behaviors are perceived differently than ingroup members' moral behaviors. Specifically, the current study examines if individuals discount the moral behaviors of outgroup members when morality is perceived as a relative (compared to absolute) concept. A total of 89 participants were randomly assigned to one of the study's four conditions. Participants first

completed a questionnaire ostensibly measuring their moral view and then are randomly assigned to receive false feedback describing their moral view/perspective as either relative or absolute. Subsequently, participants were further randomly assigned to read one of two news stories describing an ingroup or outgroup member helping a choking peer. All participants then complete questionnaires assessing their perceptions of the ingroup or outgroup member's morality. Results revealed that individuals who are led to believe they view morality as relative, not absolute, will not discount the moral behavior (i.e., devalue the peer's efforts to save a choking peer) of outgroup members compared to ingroup members. The current study sought to extend previous literature by examining the interaction between different moral perspectives and social group affiliation and the effects of this interaction of how individuals perceive others.

### **THE EFFECT OF PRIMED AFFECT ON AGE STEREOTYPES**

Sarah LeMay (Dr. Dalia Diab)  
Department of Psychology

The population of aging adults is the fastest growing demographic in the world. This is extremely salient as aging is a normal process of life, one that all living things must experience. Misunderstanding and a general lack of knowledge about aging has given way to several negative beliefs and stereotypes surrounding the elderly population. Meaningful, personal contact with elderly adults can promote tolerance, acceptance, and positive attitudinal changes in young individuals. The purpose of the current study was to examine the effect of primed affect (positive, negative, or neutral) on age-based stereotypes (ageism). Participants were primed by means of a writing prompt, which was meant to simulate specific types of personal contact with an elder adult through memory recall. Specifically, participants in the positive and negative conditions were asked to write about either a positive or negative experience with an elderly person, respectively, whereas participants in the neutral condition were asked to recall and describe their events and activities of that day. Results showed that there were no significant differences in participants' age-based stereotype expression among the different conditions. Furthermore, on average, age-based stereotypes were below neutral, suggesting an overall low level of ageism in the sample. Further analyses revealed that over three-quarters of the participants reported some to extensive experience with elder adults prior to this study. In addition, there was a small negative correlation of  $-.14$  between ageism scores and past experience with elder people indicating that more contact with elder adults was associated with lower scores of ageism, but it should be noted that this correlation did not reach statistical significance. Overall, these findings suggest that regardless of the type of contact, increased contact with elder adults may reduce ageism, but more research is needed given the lack of statistical significance.

### **EFFECT OF SELF AND PARENTAL EXPECTATIONS ON PERCEPTIONS OF NON MEDICAL PRESCRIPTION STIMULANT**

Ryan Watson (Dr. Tammy Sonnentag)  
Department of Psychology

In recent years, the use of nonmedical prescription stimulants (NPS) has been consistently increasing among college students. Studies have shown that, on average, 10% of college students will have tried NPS at least once in their college careers (Garnier-Dykstra, Caldeira, Vincent, O'Grady, & Arria, 2012). The most common motivation for why students report using NPS is to improve academic performance. For example, in a recent study, 91.5% of students who reported using NPS did so in order to study (Garnier-Dykstra et al., 2012). Consequently, the current study examines two possible causes for students' use of NPS: high self and parental expectations to succeed academically. Because previous research suggests that pressures to succeed academically are associated with increased rates of NPS use (Stoeber & Hotham, 2015), it is predicted that participants will perceive a NPS use as more appropriate when a student experiences high (compared to low) self-expectations to succeed academically, and this effect will be especially true when the student also experiences high parental pressures for academic success. Because using NPS may be considered an academically dishonest behavior, the current study also examines if the potential causes of a student's NPS use (i.e., self and parental pressure to succeed academically) influences individuals' perceptions that the student will engage in other academically dishonest behavior (e.g., cheating). Approximately 120 undergraduate students are being recruited to participate in this study. Participants are randomly assigned to one of the study's four conditions, reflecting a 2 (Self-Expectations: low vs. high) x 2 (Parental Pressure: low vs. high) between-subjects design. Participants read a scenario describing a hypothetical student who uses NPS (i.e., Adderall) in order to stay up late studying for a midterm exam. The student is described as experiencing either high or low self-expectations, accompanied by either high or low parental pressures, to

succeed academically. All participants then complete questionnaires assessing their approval of the student's use of NPS, and their perception that the student will engage in other academically dishonest behavior. Results revealed that using NPS was perceived as more appropriate when a student experiences high parental pressure compared to low, yet this effect was not moderated by the student's self-expectations to succeed academically. Further, participants perceived academic dishonesty as more likely when a student displays low self-expectations compared to high. The study contributes to the existing literature exploring the factors influencing students' use of NPS, as well as how NPS use may affect perceptions of the student's academic integrity.

### **THE EFFECT OF SOCIAL INCLUSION AND SELF AWARENESS ON SELF-ESTEEM**

Adrian Perez (Dr. Sonnetag)  
Department of Psychology

Self-esteem is an important aspect of life satisfaction (Orth et al., 2012), with heightened self-esteem contributing to greater satisfaction in life. To extend research on the association between self-esteem and life satisfaction, the current study examined if self-awareness impact individuals' self-esteem across different social situations. The study was conducted as a 2 (Self-Awareness: Heightened vs. Control) x 3 (Social Inclusion: Included, Excluded, Control) between-groups factorial design. Participants were randomly assigned to one of the study's six conditions where they read a vignette describing a hypothetical social situation where they were excluded, included, or neither included nor excluded. While reading one of the vignettes, half of participants were provided a mirror and instructed to look at and think about themselves approximately every twenty seconds throughout the study. All participants then completed a writing prompt describing when they experienced a situation similar to that described their assigned vignette. Finally, all participants completed a self-awareness and self-esteem measure. In consistent with expectations, participants who imaged being socially included did *not* report higher self-esteem than participants who imagined being rejected, and this effect was not moderated by the presence of a mirror (i.e., heightened social awareness). Critiques of the study, and ideas for future research, will be discussed.

### **THE EFFECT OF SPECTATOR TYPE ON PERCEPTIONS OF AN ATHLETE'S PERFORMANCE**

Jessica Kidd (Dr. Dalia Diab)  
Department of Psychology

This study examined the perceptions of an athlete's performance when a mother, friend, girlfriend, or an NBA scout was present in the audience. A total of 76 undergraduate students rated the performance of a basketball player in which spectators were present. It was hypothesized that participants would rate performance lower when a scout, girlfriend, or friend was present, whereas the presence of the mother would have little or no effect on performance. A one-way between-subjects analysis of variance (ANOVA) revealed a significant effect of the type of spectator present, such that the basketball player performed significantly better when his friend was present compared to when his girlfriend was present. No other significant differences were found. However, it should be noted that performance was rated above average in all conditions, regardless of the type of spectator present in the audience. Overall, these results suggest that performance may be enhanced when someone important to the player is present, particularly if that person is a friend.

### **THE EFFECT OF CONFRONTING DISPARAGING METAPHORS ABOUT WOMEN ON POLITICAL CORRECTNESS AND SEXISM**

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Previous research has demonstrated that disparaging language about women (e.g., sexualized, aggressive, submissive) negatively impacts how women are perceived, including perceptions that women are unintelligent and immoral (Murnen, 2000). Because language is thought to help individuals make sense of the world, some theorists argue that disparaging language about women may exist to help maintain a patriarchal society (Sheffield, 1987, as cited in Murnen, 2000). Consequently, the presence of disparaging language about women can reinforce the idea that (at least in U.S. society) women are less powerful than men, serving to further marginalize women in society. Although disparaging language about women may contribute to the perception that women are inferior to men, confrontation of such language can improve perceptions of women (Mallett &

Wagner, 2010). The purpose of the current study was to examine whether confronting or failing to confront disparaging metaphors about women impacts individuals' level of (ambivalent) sexism and concern for politically correct speech. A total of 89 undergraduate students were randomly assigned to one of the study's four conditions, where they read a text message conversation between two hypothetical students, where a disparaging metaphor using the word "bitch" or "slut" was or was not confronted. All participants then completed questionnaires assessing their level of (ambivalent) sexism and concern for politically correct speech. Results revealed that neither interpersonal confrontation, nor type of disparaging metaphor about women, impacted individuals' level of sexism or concern for political correctness. Results have implications for how confronting (or the lack of confronting) disparaging language about women can impact how individuals communicate in their daily lives.

### **THE EFFECTS OF EXPERIENCING SUCCESSFUL OR UNSUCCESSFUL EVENTS ALONE OR WITH OTHERS ON INDIVIDUALS' SENSE OF BELONGING**

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On October 1, 2017, Las Vegas suffered a devastating traumatic event when a shooter open fired and killed 58 people (Browne, 2017). Cities across the U.S. rushed to the aid of the victims of the shooting by sending resources to help the grief-stricken community (Bacon, 2017). Although the shooting was a devastating event, it demonstrated how individuals often come together to help others in times of need. In emergency situations, research has demonstrated that people are inclined to help and assist others more than focus on their own survival (Drury et al., 2008). This inclination to help others is not limited to emergencies or traumatic situations, but extends to positive or celebratory events, as these positive events increase people's feelings of group connectedness and decrease their emotional distance from others (Lim, Yun Cha, Park, Lee, & Kim, 2012). However, research has also demonstrated that when people experience a traumatic event together, such as a school shooting, the experience does not always promote group solidarity and may provoke group disorder (Nurmi, Rasanen, & Oksanen, 2011). Consequently, the purpose of the current study was to examine if experiencing successful or unsuccessful situations with others promotes greater feelings of belonging among people compared to experiencing the situations alone. A total of 74 undergrad female students were recruited to participate in this study. This study conducted was conducted as a 2 x 2 between-subjects design, where participants were randomly assigned to complete a crossword puzzle, alone or in small groups, designed for them to experience success or failure. Participants then completed the student belongingness (Yorke, 2016), in group-identification (Leach et al., 2008), and inclusion of others in the self (Aron, Aron, & Smollan, 1992) measures. Results revealed that experiencing the events alone or in a group, regardless of the outcome (i.e., success or failure) did not affect individuals' sense of belonging, in-group identification, or inclusion of other in self. Although the results are inconsistent with previous research, the study suggests that future research should examine if the "power" or emotional impact of an event impacts individuals' responses to successful and unsuccessful experiences. Specifically, in the current study, successfully or unsuccessfully completing a crossword puzzle may not have been emotionally powerful enough to influence individuals' reactions, regardless of whether their experience was alone or in a group.

### **THE EFFECTS OF PROFESSORS RACE AND ACCENT ON COLLEGE STUDENTS PERCEPTIONS OF PROFESSORS COMPETENCY**

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Although professors earn degrees that qualify them to teach competently in the classroom, factors like race, ethnicity, and accent could affect how students evaluate them. The purpose of this study was to examine college students' perceptions of a professor's competency based on the professor's race and accent. Participants were assigned to 1 of 4 conditions: Black professor with an African accent, Black professor with a British accent, White professor with an African accent, or White professor with a British accent. Participants saw a picture of a Black or White professor and listened to a voice recording of the professor introducing the course, speaking in either an African or a British accent. They were then asked to rate their perceptions of that professor's competency. It is hypothesized that the White professor will be perceived as more competent than the Black professor, and that the professor with the British accent will be perceived as more competent than the professor with the African accent. It is also hypothesized that race and accent will interact, such that the effect of race on competency will be stronger when the professor has a British accent. In other words, the White professor will be perceived as more competent than the Black professor, especially when the White professor has a British accent rather than an African accent. Findings

will shed light on whether a professor's race and accent could affect students' perceptions of that professor's competence.

### **THE EFFECTS OF SUSPECT RACE AND MENTAL ILLNESS HISTORY ON THE PERCEIVED ACCEPTANCE OF AND SUPPORT FOR POLICE USE OF FORCE AND OVERALL TRUST IN POLICE**

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In recent years, numerous riots in response to the use of excessive force by police officers, often against minority suspects, have received an enormous amount of media coverage. Although research has demonstrated that police officers are more likely to use excessive force against suspects who are classified as minority group members (e.g., Hispanic and Black individuals) compared to majority group members (i.e., White individuals) and against suspects displaying signs of a mental illness (Kahn, Thompson, & McMahon, 2016), little research has examined how these factors affect individuals' perceptions of police officers' use of force. The current study examined how a suspect's mental illness history (i.e., if he displayed symptoms of a mental illness or not) and race influenced perceptions of the acceptability of police use of force and overall trust in the police. One hundred and fifty one participants were randomly assigned to one of six conditions, where they read University-related police alert emails as well as a police report describing an incident on campus between the police and a Black, Hispanic, or White suspect who did or did not have a history of mental illness. The police report included a description of an officer using excessive force to detain the suspect, which resulted in a non-life-threatening injury. Participants then completed measures of their Perceived Acceptance of and Support for Police Use of Force and their Trust in Police. Results revealed that when force was used against a minority suspect, specifically a Hispanic suspect, participants reported greater amounts of trust in the police, compared to when force was used against a White or Black suspect (see Figure 1). In addition, police use of force received more perceived support when the force was used against suspects without a history of mental illness compared to suspects with a history of mental illness. Finally, when the suspect had a history of mental illness, participants perceived greater amounts of support for police use of force when it was used against Hispanic and Black suspects, compared to White suspects (see Figure 2). The current study contributes to previous literature and demonstrates that racial biases exist in individuals' support for police use of force. The current study suggests that biased incidents may need more media coverage, such that greater awareness of racial biases in police treatment of suspects may heighten the public's concern for injustices against minority individuals and promote social change.

### **THE INFLUENCE OF VERBAL AGGRESSION AND INITIATION ON AN ARGUMENT'S PERSUASIVENESS**

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Previous research has indicated that verbal aggression negatively impacts the persuasiveness of an argument in addition to negatively influencing the perceived authoritative and character of the speaker. This study, in contrast to previous studies, controlled for the effect of position taken by the initiator of a verbally aggressive argument. Participants read a debate between two individuals debating a controversial political issue, with an initiator utilizing verbally aggressive language and a respondent remaining neutral or responding with verbal aggression. Participants completed measures assessing the perceived authoritative, character, and persuasiveness of both speakers. Contrary to the hypothesis, results indicated that respondents who utilized verbally aggressive language in their response scored lower on perceived authoritative, character, and persuasiveness in comparison to respondents who did not utilize verbally aggressive language. These results suggest that more studies need to be conducted investigating verbal aggression to resolve these conflicts in the literature.

### **THE RELATIONSHIP BETWEEN SOCIAL APPROVAL AND SEXUAL HARASSMENT**

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In light of recent incidents of sexism and sexual harassment in the United States, it is necessary to examine why such acts might be condoned by some people. The current study, therefore, examined the relationship between sexual harassment and social approval. It was hypothesized that if an individual committed an act of sexual harassment but received some form of social approval, perceptions of that individual would be less

negative than if that individual did not receive social approval. To test this, undergraduate students read an informed consent form, followed by one of four vignettes which differed on two factors: whether an act of sexual harassment was committed in the workplace or not, and whether the harasser was or was not then socially approved of by their peers. Participants were asked to rate their perceptions of that individual, including whether they thought that person committed an act of sexual harassment or not. A 2x2 between-subjects analysis was used to determine the results. It was found that the main effect of sexual harassment was significant,  $F(1, 43) = 194.85, p < .001$ , in that perceptions of the individual in the vignette were significantly negative if they committed acts of sexual harassment. Results also found that the main effect of social approval was not significant,  $F(1, 43) = .12, p = .74$ , in that regardless of social approval, perceptions of sexual harassment were negative. In other words, participants' perceptions of the individual in the vignette were not affected by social approval, but instead were based solely on the individual's behavior. These findings are promising and indicate a disapproval of sexual harassment on an individual basis, which could correlate with perceptions of sexual harassment as a whole. However, due to this studies limitations, further research is needed in order to make that claim.

## THEOLOGY

### **A BROAD VIEW OF STRUCTURAL RACISM AND ITS CONTRIBUTION TO MASS INCACERATION IN THE UNITED STATES**

Tianna Vozar (Dr. John Sniegocki)  
Peace & Justice

Though seemingly far removed from the systems of oppression that once kept minority groups from establishing equality and respect in this country, rippling effects of slavery and segregation still plague this nation. Systematic disadvantages have cumulative effects on communities of color and low socioeconomic status. These factors disproportionately affect the likelihood of involvement in the criminal justice system and have a cyclical nature that significantly contributes to mass incarceration in the United States. This project takes a broad view of these factors and details some of the ways in which large scale institutions routinely disadvantage communities of low income and communities of color, leading to a disproportionate burden on these groups. This project also details some courses of action that we can take now to address these issues on both a large scale institutional level and on an interpersonal level.