2019 STUDENT RESEARCH COLLOQUIUM

FRIDAY, APRIL 26, 2019
MCINTOSH CENTER

OHIO NORTHERN UNIVERSITY
CELEBRATING STUDENT RESEARCH ACHIEVEMENT
10 A.M.–2 P.M.
Poster sessions and paper presentations
https://www.onu.edu/research/colloquium
Welcome to the 2019 Ohio Northern University Student Research Colloquium!

The Student Research Colloquium is a true showcase for university research, with students from our four undergraduate colleges scheduled to present 97 projects this year. For those who participate, research bridges the gap between knowledge and experience and provides for career exploration and development. Presenters at this year’s Colloquium will share the results of their research with the larger academic community, enliven the intellectual climate on campus, and stimulate discussions and collaborations within and across disciplines, all while developing skills important to their long-term personal and professional success.

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Colloquium Schedule

All 2019 Student Research Colloquium activities take place in the ONU McIntosh Center.

Check-in
9:30 a.m.-1 p.m. All paper and poster presenters; paper presenters should then touch base with their session moderators.

Papers
Deans’ Heritage Room
10-11:45 a.m. Public Relations, Political Science and Philosophy, Politics and Economics
12-1:45 p.m. Communication Studies

Papers
Wishing Well
10-11:45 a.m. Advertising Design and Graphic Design
12-2 p.m. Public Health, Sociology and Engineering

Posters
Activities Room
10:15-11:15 a.m. Athletic Training, Biology, Geography and Marketing
11:30 a.m.-12:30 p.m. Pharmacy, Psychology, Theatre, Mathematics and Physics
12:45-1:45 p.m. Manufacturing Technology, Political Science, Nursing and Chemistry

We encourage our presenters, research mentors, and other guests to attend the various poster and paper presentations on the schedule above. In the spirit of celebrating student achievement, we also invite participants and campus visitors to check out our student art exhibitions in the Elzay and Stambaugh Galleries.

Acknowledgments

★ Many thanks are extended to all members of the ONU community who have helped to make the 2019 Student Research Colloquium such a success.
★ The staff members of the Office of Communications and Marketing and Printing Services, especially Sheila Baumgartner and Joshua Crawford, deserve special mention for producing these lovely programs.
★ The staff members of Physical Plant, Catering, and the McIntosh Center, especially David Del lifield, are invaluable in helping with all the behind-the-scenes details that bring our Colloquium to fruition each year.
★ Sincere gratitude is offered to Dean Holly Baumgartner and the Getty College of Arts and Sciences for generous funding of this event.
★ The Colloquium could not run as smoothly as it does without the unstinting efforts of members of the Getty College of Arts and Sciences Student Advisory Board and student volunteers from across Ohio Northern University.
★ Additional thanks go to all the student presenters and their faculty mentors who ensure that scholarly research and deep learning are integral to an Ohio Northern education.
★ Finally, we thank all friends and family of and visitors to the Northern community and welcome your presence today.
Selection Process for Publication in *Aurora*

The 2019 Student Research Colloquium Conference Proceedings

Thank you for your interest in the publication of your work in *Aurora: The Research Journal of Ohio Northern University*. Those who wished to be considered for publication indicated their preference on the online registration form submitted earlier this spring. The *Aurora* editorial staff will review abstracts over the summer and contact you in the fall.

If you have any questions, please contact the Co-Editors-in-Chief, Matthew Haase (m-haase@onu.edu) or Alaina Mikolajewski (a-mikolajewski), or Dr. Jonathan Pitts, Faculty Advisor, at j-pitts@onu.edu.

Institutional Affiliation

Unless otherwise noted, all presenters and research advisors participating in the 2019 Student Research Colloquium are students, faculty or staff of Ohio Northern University.

## Paper Presentations

### Public Relations, Political Science and PPE

<table>
<thead>
<tr>
<th>Topic</th>
<th>Presenter</th>
<th>Time</th>
<th>Room</th>
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</thead>
<tbody>
<tr>
<td>Life Coaching and Social Media</td>
<td>Tori Middlebrooks</td>
<td>10-11:45 a.m.</td>
<td>Deans’ Heritage Room</td>
</tr>
<tr>
<td>Politics of Awards/Blockbuster Films in the 21st Century</td>
<td>Jeff E. Alexander</td>
<td>10-11:45 a.m.</td>
<td>Deans’ Heritage Room</td>
</tr>
<tr>
<td>Putting Money Where Your Mouth Is: A Media Analysis of Online Betting Markets</td>
<td>Seth M. Ferguson</td>
<td>10-11:45 a.m.</td>
<td>Deans’ Heritage Room</td>
</tr>
<tr>
<td>Philosophy of Leadership and Making an Ethical Decision</td>
<td>Ahlam S. Anteer</td>
<td>10-11:45 a.m.</td>
<td>Deans’ Heritage Room</td>
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### Communication Studies

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<tr>
<th>Topic</th>
<th>Presenter</th>
<th>Time</th>
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<tbody>
<tr>
<td>Diversity at Ohio Northern University</td>
<td>Tori Middlebrooks</td>
<td>12-1:45 p.m.</td>
<td>Deans’ Heritage Room</td>
</tr>
<tr>
<td>Speak for Yourself</td>
<td>Allison Ditch</td>
<td>12-1:45 p.m.</td>
<td>Deans’ Heritage Room</td>
</tr>
<tr>
<td>Identifying Communication Gaps between Care Coordinators and Physicians</td>
<td>Madison Essinger</td>
<td>12-1:45 p.m.</td>
<td>Deans’ Heritage Room</td>
</tr>
<tr>
<td>“Mom and Pop” Shops, Social Media and College Students</td>
<td>Emily Kristine Fergus</td>
<td>12-1:45 p.m.</td>
<td>Deans’ Heritage Room</td>
</tr>
<tr>
<td>What Do You Want from Me? - Said the Church: A Guide to Better Church Communication</td>
<td>Michaela Long</td>
<td>12-1:45 p.m.</td>
<td>Deans’ Heritage Room</td>
</tr>
<tr>
<td>Analyzing the Communication between Athletes and Coaches</td>
<td>Grant F. McConnell</td>
<td>12-1:45 p.m.</td>
<td>Deans’ Heritage Room</td>
</tr>
<tr>
<td>Rhetorical Analysis of Bethesda’s Todd Howard and His E3 Presentation</td>
<td>Michael D. Schroeder</td>
<td>12-1:45 p.m.</td>
<td>Deans’ Heritage Room</td>
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### Advertising Design and Graphic Design

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<th>Topic</th>
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<tbody>
<tr>
<td>Nutrition and the Distance Runner</td>
<td>John McNutt</td>
<td>10-11:45 a.m.</td>
<td>Wishing Well</td>
</tr>
<tr>
<td>Your Region Is Here</td>
<td>Bryan Z. Kelly</td>
<td>10-11:45 a.m.</td>
<td>Wishing Well</td>
</tr>
<tr>
<td>Arrive Alive Allen County</td>
<td>Catherine Jenks</td>
<td>10-11:45 a.m.</td>
<td>Wishing Well</td>
</tr>
<tr>
<td>Mother Goose Suds: Brand Development</td>
<td>Alexander N. Gesler</td>
<td>10-11:45 a.m.</td>
<td>Wishing Well</td>
</tr>
<tr>
<td>Breadless: Living Without</td>
<td>Soteria Mathewson</td>
<td>10-11:45 a.m.</td>
<td>Wishing Well</td>
</tr>
<tr>
<td>Poke: Mindfulness Made Fun</td>
<td>Emily Kristine Fergus</td>
<td>10-11:45 a.m.</td>
<td>Wishing Well</td>
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<tr>
<td>Recovery</td>
<td>Kevin Cook</td>
<td>10-11:45 a.m.</td>
<td>Wishing Well</td>
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### Public Health, Sociology and Engineering

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<tr>
<th>Topic</th>
<th>Presenter</th>
<th>Time</th>
<th>Room</th>
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</thead>
<tbody>
<tr>
<td>Seasonal Affective Disorder (SAD), Physical Activity, and Nutrition</td>
<td>Kaitlin Rubottom</td>
<td>12-2 p.m.</td>
<td>Wishing Well</td>
</tr>
<tr>
<td>Pilot Testing a Virtual Reality-based Intervention for Irritable Bowel Syndrome</td>
<td>D. Josh Mohn</td>
<td>12-2 p.m.</td>
<td>Wishing Well</td>
</tr>
<tr>
<td>Risky Behaviors Associated with Contact Lens Use</td>
<td>Moko Tanaka</td>
<td>12-2 p.m.</td>
<td>Wishing Well</td>
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<tr>
<td>The Link between Eating Disorders and Bullying</td>
<td>Joy Yancy</td>
<td>12-2 p.m.</td>
<td>Wishing Well</td>
</tr>
<tr>
<td>The Evolved Parallel Spiking Neural Network</td>
<td>Derek Michael Smith</td>
<td>12-2 p.m.</td>
<td>Wishing Well</td>
</tr>
<tr>
<td>Avoiding the Syntax: An Accessible Approach for Introducing First-year Engineering Students to Microcontrollers</td>
<td>Will Sierzputowski, Josephine Palmer, Tylar Dazey, Karli Katterle</td>
<td>12-2 p.m.</td>
<td>Wishing Well</td>
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</table>
Athletic Training Biology Geography and Marketing
10:15-11:15 a.m.

1. “The Impact of Sleep Deprivation on Reaction Time in College Athletes”
   Montana Moore, Daniel Rohan
2. “Athlete Demographic Had No Impact on Personality Traits of Athletic Trainers”
   Bailey Hudson, Jarrod Woodland
3. “Effects of Different Aerobic Training Techniques on Vital Capacity and Breath Hold”
   Luke Fickenworth, Trie Le, Jarrod Fair, Ashlynn Hickey
4. “Efficacy of Prunella vulgaris in Vasodilation of Isolated Renal Arteries from Bos taurus”
   Rand Abdullatef, Nathaniel H. Emerson, Alyssa Griffith, Maggie Krause, Jacob Thompson
5. “Anatomical Comparison of the Carapace of Turtles and Armadillos”
   Olivia Keserich
6. “Effects of Host Sex and Ontogeny on the Skin-associated Microbiomes of Acris crepitans”
   Gunner M. Stoll, Tyler T. Tanto
7. “Changes in Daylight Intensity Alters Gut Bacterial Microbiome of Zoo-housed Pottos”
   Paige Goodwin
8. “Assessing Host-symbiotic Relationships to Inform Restoration Efforts of Eastern Oysters (Crassostrea virginica) in the Gulf of Mexico”
   Aly Milks, Kelli Hill, Bailey Logsdon
9. “Baseline Analysis of Freshwater Lotic Communities Surrounding a Decommissioned Low Head Dam Prior to Removal”
   Zachary A. Bragg, Everett D. Meredith, Tyler T. Tanto
10. “The Ohio Northern Tree Project: A Comprehensive Campus Tree Survey with Community Education and Outreach”
    Zachary A. Bragg
11. “Cincy Dog Park: A Site Suitability Analysis”
    Zachary A. Bragg
12. “A Suitability Analysis of Dairy Queen in Sylvania, Ohio”
    Sean McGill, Cade Saunders
    Jameson Curry
14. “A New Breakfast-only Restaurant in Lima, Ohio: A Site Suitability Analysis”
    Sean DeVony
15. “A New Day Spa in Lima, Ohio”
    Jeyn Pratt
16. “A Geospatial Analysis of Cleveland Suburb Parks”
    Jessica Robinson
    Spencer Stites
18. “An Analysis of the Viability of an Existing Auto Repair Shop in Ada, Ohio”
    Garrett Dietrich, Julie Foreman
19. “Arlington Indoor Ski Resort”
    Ireland Hoffman, Mackenzie Wills
20. “An Analysis of the Viability of an Existing Auto Repair Shop near Lakeview-Russell’s Point, Ohio”
    Seth Hartman
    Devin Johnson, Nolan Yarhmarkt
22. “A New BBQ Restaurant in Findlay, Ohio: A Site Suitability Analysis”
    Kyle Desana, Andrew Mills
23. “The Viability of a Record Store in Ada, Ohio”
    Travis Yammine
24. “The Viability of a New Pharmacy in Findlay, Ohio”
    Takashi Yuzawa

Pharmacy, Psychology, Theatre, Mathematics and Physics
11:30 a.m.-12:30 p.m.

1. “Pharmacy Student-led Pre-visit Medication Reviews”
    Jordan G. Hughes, Brandon Kasberg, Alexandra Latala, Emily Howell
2. “Service Learning: A Student Perspective”
    Brandon Kasberg, Jordan G. Hughes, Emily Howell, Alexandra Latala
3. “An Evaluation Tool for Pharmacy Student Service Learning Experiences”
    Jordan G. Hughes, Brandon Kasberg, Emily Howell, Alexandra Latala
4. “Focusing in on Training Upcoming Academicians: Interviews of Pharmacy Resident Teaching Certificate Leaders in Ohio”
    Karielle Shaffery
5. “Role of RGS2 Proteins in Reward”
    Nathaniel H. Emerson, Madison Rose, Sara Asswini, Sara Seeley
6. “Role of RGS4 Proteins in Reward”
    Sara A. Asswini, Madison Rose, Nathaniel H. Emerson, Sara Seeley
7. “Regulation of Exchange Protein Directly Activated by cAMP (EPAC1) by Hypoxia in Human Endothelial Cells”
    Alexis Nicole Dayton, Alexander Nixon, Richard Morris
8. “Chemical Stability Evaluations of Sincalide (Kinevac®), a Diagnostic Aid, at Two Different Storage Conditions”
    Eric Belanger
    Charis D. Kasler, Cassandra S. Goodman, Kasey E. Mucher, Alanis S. Allison, Ian F. Smith, Jordan L. Dodson, Thorne S. Stoops, Kara M. Elmouhawesse
10. “Stress that Is Temporally Separated from Learning Sex-dependently Affects Long-term Memory in a Forced Confabulation Paradigm”
    Mackenzie Rene’ Riggenbach, Jordan N. Weiser, Leighton E. Wireman, MacKenzie G. Kaschalk, Kassidy E. Renua, Sara J. Helwig
11. “Carriers of the Met Allele of the BDNF Val66Met Polymorphism Develop Weaker Fear Memories in a Fear-potentiated Startle Paradigm”
  Jordan N. Weiser, Mackenzie Rene’ Riggenbach, Leighton E. Wireman, MacKenzie G. Kaschalk, Kassidy E. Reneau
12. “Immediate Pre-learning Stress Enhances Fear Acquisition and Delays Long-term Extinction in a Fear-potentiated Startle Paradigm”
  Mackenzie Rene’ Riggenbach, Jordan N. Weiser, Leighton E. Wireman, MacKenzie G. Kaschalk, Kassidy E. Reneau
13. “Gender Differences in Lethal Force Decision-making”
  Mackenzie Rene’ Riggenbach
  Ian F. Smith
15. “The Impact of Applicant Gender and Shirt Color of Applicant on Hireability”
  Kaitlyn Ashley Krill, Whitney Jones-Downs, Emma Virden, Elisabeth Moeller
  Kaitlyn Hurd, Allison Dennis, Joshua Mohr
17. “The Impact of Emotionality of Positive or Negative Music on the Recall of Positive or Negative Emotional Events”
  Kassidy E. Reneau, Josilyn Lieb, Elizabeth Wenning
  Paige Goodwin, Trystan Norman
19. “Dramaturgy of Hayavadana”
  William Hartman
20. “New Gas Kinematics for the Pseudobulge Galaxy NGC 1291”
  Justin Chapman
21. “Unmagnetized Rotating Yukawa Ring in a Dusty Plasma”
  Matt J. Sibila
22. “Theoretical Background for Experiments Testing Bell’s Inequalities”
  Bryan Peck
  Bradley Lockhart
  Bradley Lockhart

Manufacturing Technology, Political Science, Nursing and Chemistry
12:45-1:45 p.m.

1. “2019 ATMAE Robotics Competition Team”
   Jacob Cordle, Bryce Bouman, Rachel Kerber, Cole Tabor, Ashlie Szippel, Joe Peace
2. “Manufacturing Work Cell”
   Richard Jones, Michael Rinehart, David Schuring, Kyle Tucker, Tavarius Simms
3. “The Medicalization of FGM: Difficulty in Abolishing the Practice”
   Mahawa Koroma
4. “Determining If Code Blue Simulations Improve Confidence in Acute Care Nurses”
   Grant Cayot
5. “The Use of Humor to Reduce Stress among Nurses and Increase Patient Safety”
   Alexander M. Cline
6. “Reducing Medical Waste on a Neurology Unit”
   Courtney Michelle Niesen
7. “Stethoscope Hygiene in the Emergency Department”
   Laura Houtz Burden
8. “Re-education Techniques for Pain Management”
   Kelsey Kerr
   Michaela A. Sharlow
10. “Oral Care Compliance to Lower Infection Rates”
    Kathleen S. Miller
11. “Nurse Staffing Ratios and Patient Safety”
    Colleen Grainger
12. “Situation, Background, Assessment, and Recommendation during Nurse-to-nurse Shift Report”
    Mackenzie E. Horwath
13. “Increasing Visibility of Restricted Limbs”
    Nicole Michalek
    Hannah Price
15. “Does Self Care Deficit Contribute to Burnout in Nurses?”
    Megan Will
16. “Peripheral Intravenous Catheter Infections”
    Brenna Dee
17. “Design and Synthesis of Amine Bis(phenolate) Ligands for Applications in Catalysis”
    Claire Griffith
    Kristina Myers
19. “Exploration of Non-symmetrical Amine Bis(phenolate) Ligands Using a Combined Synthetic and Computational Approach”
    Nicole Braunschield
20. “Preparation of Manganese Complexes of Amine Bis(phenolate) Ligands”
    Nathaniel C. McCutcheon
    Samuel R. Powell, Timothy Dunn
    Samuel R. Powell
23. “Analysis of Methanesulfonic Acid in Water”
    Rebecca L. Beres
24. “Progress toward Methanesulfonic Acid Analysis in the Marine Environment”
    Sarah K. Jones
“2019 ATMAE Robotics Competition Team”
Poster 1, 12:45-1:45 p.m., Activities Room
Research Advisors: David Rouch (Technological Studies), Richard Miller (Technological Studies)

This study and report is a step-by-step breakdown of how we, as a group, have prepared for the 2019 ATMAE Robotics Competition in Kansas City, Missouri. We were given the task of designing and building a robot that could autonomously navigate a random maze, and at the end of the maze, identify and cut a specific wire in order to deactivate a target. The robot was designed to satisfy limitations to complete the tasks specified for the competition. The following documentation summarizes every stage of design and build of the robot. This report describes the responsibilities of what each group member oversaw, the design of the robot, the CAD models that were created throughout the project, an overview of the software that was used and why we chose to use the specific software we did, a wiring diagram, a one-page experience document from each team member, and ending with the appendices, which shows documentation that was collected over time in completion of the project. Finally, this report describes the iterative process used from design concept to final assembly.

“A Computational Investigation of the Catalytic Cycle of Urea Anions as Catalysts for Ring-opening Polymerization of Lactones”
Poster 22, 12:45-1:45 p.m., Activities Room
Presenter: Samuel R. Powell (Chemistry)
Research Advisor: Trilisa M. Perrine (Chemistry and Biochemistry)

The polymerization of lactones is a common method to produce polyesters, which have many applications in industry. However, achieving efficient polymerization with minimal byproducts and high molecular weight often requires a catalyst. Catalysts that have been used for the ring-opening polymerization of lactones include metal complexes and some acid catalysts. Recently, a series of anionic urea catalysts have been synthesized and used to successfully polymerize a series of lactones. We are computationally probing the reactive mechanism of these catalysts to understand what properties lead to successful polymerization. We are searching for the transition states to elucidate the mechanism of the reaction so that we can understand why some catalytic molecules are more effective than others. Determining the high-energy points of the reaction pathway helps us to understand why the reactions proceed the way they do and what is important and unique about the polymerization process. It appears that a subtle change in the conformation of the catalyst molecule is an important step in the catalytic cycle of this class of catalyst. We also are hoping to propose a new catalyst in this class using the knowledge we gain about the steric and electronic requirements for a successful catalyst.

“A Geospatial Analysis of Cleveland Suburb Parks”
Poster 16, 10:15-11:15 a.m., Activities Room
Presenter: Jessica Robinson (Management)
Research Advisor: Harry Wilson (Business Administration)

Going to a public park in the summer is a favorite pastime for many children. Parents enjoy the socialization and seating available that parks provide, while their children play on equipment and spend time with friends. Parks often offer trails, dog parks, and workout classes to attract more segments of the population besides just families with small children. This research study examines current public parks within the Cleveland suburbs and compares their amenities, activities offered, and their popularity in terms of park attendance. Using common geoanalytical techniques, we validate the location of these parks based on population density, presence of children, average family income, and other commonly-used variables.

“A New BBQ Restaurant in Findlay, Ohio: A Site Suitability Analysis”
Poster 22, 10:15-11:15 a.m., Activities Room
Presenters: Kyle DeSana (Marketing), Andrew Mills (Marketing)
Research Advisor: Harry Wilson (Business Administration)

BBQ restaurants are popular lunch and dining destinations for many people in most cities. Most restaurants pride themselves on unique rubs and sauces that serve to support their customer base and set them apart from their competitors. For many BBQ restaurants, the quality of their unique menu determines the success of their business. This project assesses the worth of an existing BBQ restaurant in the Findlay, Ohio, area and confirms that the restaurant will continue to be a profitable establishment. This will be done by analyzing current BBQ restaurants profitability within Findlay and analyzing market potential for restaurants as a whole. A suitability analysis will also be performed determining worth of the restaurant’s current location.

“A New Breakfast-only Restaurant in Lima, Ohio: A Site Suitability Analysis”
Poster 14, 10:15-11:15 a.m., Activities Room
Presenter: Sean DeVany (Management)
Research Advisor: Harry Wilson (Business Administration)

Most people begin their day with some version of a breakfast. While many people eat breakfast at home, countless others enjoy this first meal of the day on their way to, or from, work. For those businesses who provide breakfast, there currently exist substantial opportunities to generate considerable revenue. This research analyzes the potential for a breakfast-only restaurant in Lima, Ohio. We identify potential customers and analyze their spending habits with regard to dining away from home for breakfast, and we examine existing restaurants that cater to this market. The data gathered from this geospatial analysis allows us to conclude that a breakfast-only restaurant will be a viable option for Lima, OH. We also rely on
geospatial analysis to propose a location for this new restaurant.

“A New Day Spa in Lima, Ohio”
Poster 15, 10:15-11:15 a.m., Activities Room
Presenter: Jevyn Pratt (Management)
Research Advisor: Harry Wilson (Business Administration)

Day spas are a popular destination for many people in the United States. These businesses promise to provide services that help customers relax in a calm and peaceful environment. Common services include massage, aroma therapy, acupuncture, manicures, electrolysis, exfoliation, and hair styling. Given the specialized nature of services provided, state and federal regulations require they be provided by trained and licensed practitioners. As such, the cost of frequenting a day spa can be expensive, and many consider it a luxury. This research examines the worth of a new day spa in Lima, Ohio. It relies on geospatial analysis of Lima area residents and their spending habits to conclude that the city would support a new day spa. We also examine traffic and resident living patterns to suggest a location for this new business.

“A New Residential Cleaning Business in Toledo, Ohio: A Site Suitability Analysis”
Poster 13, 10:15-11:15 a.m., Activities Room
Presenter: Jameson Curry (Management)
Research Advisor: Harry Wilson (Business Administration)

Residential cleaning services are popular in larger metropolitan communities. This is especially true in neighborhoods comprised of upper and middle class residents. Residential cleaners provide a valuable and lucrative service, if properly staffed and positioned within the community. This research analyzes the demographics of Toledo and existing residential cleaning services to determine the feasibility of adding another business to the area. It also proposes a location for the new business that is based on modern geospatial analysis.

“A Predator-based Animal Model of Post-traumatic Stress Disorder in Females: Influence of Estrous Phase and Ovarian Hormones”
Poster 9, 11:30 a.m.-12:30 p.m., Activities Room
Presenters: Charis D. Kasler (Chemistry), Cassandra S. Goodman (Pharmacy), Kasey E. Mucher (Pharmacy), Alanis S. Allison (Psychology – Clinical and Counseling), Ian F. Smith (Psychology – Behavioral Neuroscience), Jordan L. Dodson (Nursing), Thorne S. Stoops (Pharmacy), Kara M. Elmouahwesse (Psychology, French)
Research Advisors: Phillip R. Zoladz (Psychology, Sociology, and Criminal Justice), Boyd R. Rorabaugh (Pharmaceutical and Biomedical Sciences)

We examined the influence of estrous stage and ovarian hormones on female rat responses to an animal model of PTSD. Female Sprague-Dawley rats were exposed to psychosocial stress or control conditions for 31 days. Stressed rats were given two separate cat exposures and daily social instability; control rats were handled daily. Beginning on Day 32, rats underwent physiological or behavioral testing. In Experiment 1, vaginal smears were collected on days of the first and second cat exposures and each day of behavioral testing to determine estrous stage. In Experiments 2 and 3, ovariectomized or sham control rats were exposed to stress or control conditions. Then, they were given behavioral testing (Exp 2) or their hearts were isolated and subjected to 20-min ischemia/2-hr reperfusion on a Langendorff isolated heart system. Chronic stress increased anxiety-like behavior, irrespective of estrous stage or ovariectomy condition. Ovariectomized females displayed greater startle responses and anxiety-like behavior than sham controls. Stress had no impact on myocardial sensitivity to ischemic injury; however, ovariectomized females exhibited greater ischemia-induced infarction than sham controls. These findings suggest that ovarian hormones do not interact with chronic stress to influence the development of PTSD-like physiological and behavioral sequelae in female rats.

“A Suitability Analysis of Dairy Queen in Sylvania, Ohio”
Poster 12, 10:15-11:15 a.m., Activities Room
Presenters: Sean McGill (Sport Management), Cade Saunders (Management)
Research Advisor: Harry Wilson (Business Administration)

When looking for a tasty cold treat on a hot day, Dairy Queen is a name most everyone would recognize and frequent. Dairy queen is an ice cream chain that has been around since the 1940’s that has spread across the United States and become a household name. However, in 2019 there are many more shops that ice cream lovers have learned to know and visit. This research examines the Dairy Queen in Sylvania, Ohio, a suburb of Toledo, and determines whether this business can compete with newly established competitors nearby. We perform a suitability analysis using common geospatial data and research techniques. We analyze the characteristics and location of Sylvania residents as customers, the Dairy Queen’s location, capital, and operation costs. We conclude that this location is not sustainable, identify a new location close to Sylvania where Dairy Queen will succeed.

“An Analysis of the Viability of an Existing Auto Repair Shop in Ada, Ohio”
Poster 18, 10:15-11:15 a.m., Activities Room
Presenters: Garrett Dietrich (Risk Management and Insurance), Julie Foreman (Marketing)
Research Advisor: Harry Wilson (Business Administration)

The overwhelming majority of automobile owners in the United States rely on trained mechanics to service their vehicle. The auto service industry, as such, remains very successful, and will continue to be so in the foreseeable future. This is true in cities of all sizes, even Ada, Ohio. This project assesses the sustainability of an existing auto mechanic shop in the Ada, Ohio, utilizing conventional geospatial analysis techniques. This will be done by comparing similar auto mechanic stores in other villages to run a suitability analysis to show that Ada’s current auto mechanic shop is a good place for that particular type of business.

“An Analysis of the Viability of an Existing Auto Repair Shop near Lakeview-Russell’s Point, Ohio”
Poster 20, 10:15-11:15 a.m., Activities Room
Presenter: Seth Hartman (Pharmaceutical and Healthcare Business)
Research Advisor: Harry Wilson (Business Administration)
The villages of Lakeview and Russell’s Point, Ohio, are known for a neighboring state park, bike trails, and beaches. They have their own protected harbors, docks, and boat ramps affording access to Indian Lake. Both of these villages are very popular vacation destinations for outdoor enthusiasts. Some come for the day, while others stay weeks and months. In addition, this destination supports many successful businesses. One of the more popular businesses is an existing auto service shop that provides full service to most common types of cars and trucks. This study relies on geospatial analysis to emphasize the lucrative nature of the existing auto service shop in the area. It shows that the local residents and tourists provide the means for supporting the business, and will continue to do so for many years.

“An Evaluation Tool for Pharmacy Student Service Learning Experiences”
Poster 3, 11:30 a.m.-12:30 p.m., Activities Room
Presenters: Jordan G. Hughes (Pharmacy), Brandon Kasberg (Pharmacy), Emily Howell (Pharmacy), Alexandra Latala (Pharmacy)
Research Advisor: Michelle R. Musser (Pharmacy Practice)

Objective: Service learning provides a valuable experience for students and augments health care in local communities. An evaluation tool was developed to assess student and preceptor feedback on service learning experiences. Methods: Pharmacy students are required to complete forty hours of service learning during their professional program. Following each service learning event, students complete a self-evaluation, triggering a preceptor evaluation using an online survey tool. Data was collected from students and preceptors over an academic year. Results: Students documented 6509 hours of service and cared for over 39,000 patients throughout the academic year. Common event locations, patient interactions, and services were identified. Opportunities to improve student exposure to interprofessional practice, innovation, and mentorship during service learning were noted. Preceptor evaluations were completed for 78% of student experiences and were overwhelmingly positive. Common feedback included a need for students to increase clinical confidence, but praised students’ screening technique and professionalism. Student self-assessment was supported by preceptor feedback. Implications/conclusions: An online tool evaluated data on a large service learning program. Tracking of service learning opportunities allows for program improvement, while student self-assessment and preceptor feedback allows evaluation of performance.

“Analysis of Methanesulfonic Acid in Water”
Poster 23, 12:45-1:45 p.m., Activities Room
Presenter: Rebecca L. Beres (Biochemistry)
Research Advisor: Christopher E. Spiese (Chemistry and Biochemistry)

Methanesulfonic acid (otherwise known as MSA, CH3SO3H) is one of the known leading components found in the world sulfur cycle. MSA, however, is hard to measure, and analysis of this compound is limited to only very pure water samples. By utilizing methods such as reducing methanesulfonic acid (otherwise known as MSI, CH3SO2H) and reacting it with a type of diazo compound such as Fast BB Blue, a UPLC could effectively quantify the amount of sulfur found in a given water sample. In order to understand this world sulfur cycle, quantification of MSA, MSI, and other sulfonic acids is critical. Currently, one of the only ways that MSI can be detected in water is by using a type of chromatography, but this can be very difficult due to the high concentrations of other molecules such as salts found in most seawaters. Once this method is developed and tested in ultrapure water, this method could potentially be used on seawater samples such as the Gulf of Maine and Sargasso Sea. From there, this method could more accurately illustrate what happens in the marine sulfur cycle.

“Analyzing the Communication between Athletes and Coaches”
Paper 6, 12:1-1:45 p.m., Deans’ Heritage Room
Presenter: Grant F. McConnell (Communication Studies)
Research Advisor: Mark D. Cruea (Communication and Media Studies)

Coaches constantly communicate with their athletes on and off the court. There are many different types of communication strategies and preferences for coaches. This paper examines some of the coaching communication that goes on at Ohio Northern University. Through a series of interviews, three coaches’ communication styles were examined. The six styles we focused on are: Autonomy Supportive, Autonomy Thwarting, Competence Supportive, Competence Thwarting, Relatedness Supportive, and Relatedness Thwarting. After that, we surveyed senior athletes of those coaches to get their input. Lastly, we analyzed the data to compare if the results matched up or if there was a disagreement by the players with how the coach communicated.

“Anatomical Comparison of the Carapace of Turtles and Armadillos”
Poster 5, 10:15-11:15 a.m., Activities Room
Presenter: Olivia Keserich (Biology)
Research Advisor: Timothy Koneval (Biological and Allied Health Sciences)

Carapaces are protective coverings on an animal’s body. Although many animals have these protective shells, the composition between them vary drastically. Using samples from Ohio Northern University’s museum, we compared the structure and function of the shells of Dasypus novemcinctus, the nine-banded armadillo, with that of several species of land turtles. Both armadillos and turtles have a carapace that includes several bony elements underneath combined with horny scutes above. We found that the structure of the turtles varied from the nine-banded armadillos, in that they were much thicker and had the ribs fused to the dermal bone. The armor of armadillos was more flexible and molded itself around the body of the animal; the turtle’s armor was more rigid. We are also currently in the process of creating 3-dimensional models for both the turtle and armadillo carapaces in Autodesk Inventor to generate pressure simulations. This will allow us to better understand the reason for these functional differences and why their design suits that species the best.

“Arlington Indoor Ski Resort”
Poster 19, 10:15-11:15 a.m., Activities Room
Presenters: Ireland Hoffman (Pharmaceutical and Healthcare Business), Mackenzie Wills (Pharmaceutical and Healthcare Business)
Snow skiing continues to be a popular sport for many in the United States. This is also true of residents of Northwest Ohio. However, skiing enthusiasts who live in Northwest Ohio have to wait on sufficient snowfall at ski resorts, and travel over an hour to enjoy a day of skiing. We propose a business venture that would result in an indoor ski slope situated near Arlington, Ohio. The current research relies on geospatial analysis to show the worth of Northwest Ohio for such a large venture. We look at other indoor ski slopes and compare their customer base to those living in Northwest Ohio. We show that this new business would quickly become profitable and remain a popular sports destination for many years.

“Arrive Alive Allen County”
Paper 3, 10:11-11:45 a.m., Wishing Well
Presenter: Catherine Jenkins (Graphic Design)
Research Advisors: Henry L. Sheets (Art and Design), William Britton Rowe (Art and Design)

The effects of drinking and driving have become a huge part of my life. A few drinking and driving campaigns currently take place across the United States that bring drinking and driving to the public eye. Few campaigns take place at local levels. This is where I want to focus my work. Starting local allows for a greater impact than trying to create something for a whole nation. The research for this campaign consists of interviews from a retired Allen County Sheriff and people from the Lima-Allen County Safe Community Coalition. The research finds the needs of a local level campaign in the area. Arrive Alive Allen County is a campaign aimed to inform people of the dangers of drinking and driving and how it can be a life-altering or life-ending decision. The target audience is persons aged 15-25. This group is more likely to be influenced and more likely to decide to drink and drive. Arrive Alive Allen County creates a safer community through the use of a website, a variety of posters and a billboard series as well as a program to reach high school and college students.

“Assessing Host-symbiobnt Relationships to Inform Restoration Efforts of Eastern Oysters (Crassostrea virginica) in the Gulf of Mexico”
Poster 8, 10:15-11:15 a.m., Activities Room
Presenters: Aly Milks (Environmental and Field Biology), Kelli Hill (Environmental and Field Biology), Bailey Logsdon (Environmental and Field Biology)
Research Advisor: Katherine L. Krynak (Biological and Allied Health Sciences)

Eastern oyster (Crassostrea virginica) reefs provide valuable ecosystem services to coastal regions. Reefs have dramatically declined in recent years due to coastal habitat degradation. Studies assessing differing methodologies should be tested to improve restoration success. Alongside a study conducted by the Florida Fish and Wildlife Conservation Commission and The Florida State University Coastal and Marine Lab examining oyster density and growth across five artificial reef substrates, Ohio Northern University students assessed the symbiotic bacterial communities of the oysters across these substrates. It was hypothesized that substrate type influences bacterial composition and predicted that bacterial community variation is associated with nutrient additives in the substrates. Oyster bacterial communities (N=25) were compared between substrates using terminal restriction fragment length polymorphism (TRFLP) analysis of polymerase chain reaction (PCR) product amplifying the 16s rRNA gene region of bacterial DNA. Substrate type did not significantly affect bacterial community composition according to nonmetric multidimensional scaling ordination and permutation-based analysis (PERMANOVA: F(4,20)=1.4, P=0.134). Despite potential importance of symbiotic bacterial communities to oyster health and public safety, knowledge of these bacterial communities is lacking. Bacterial communities remaining constant over substrate types was a desired result, and allows for restoration efforts to focus on oyster growth.

“Athlete Demographic Had No Impact on Personality Traits of Athletic Trainers”
Poster 2, 10:15-11:15 a.m., Activities Room
Presenters: Bailey Hudson (Athletic Training), Jarod Woodland (Athletic Training)
Research Advisors: Kurt Wilson (Human Performance and Sport Sciences), Scott Swanson (Human Performance and Sport Sciences)

Context: Athletic trainers are being utilized more and more in the medical field today. As the profession continues to grow it becomes increasingly important to comprehend what is expected from the view of the athletes. Objective: The objective of this study is to assess and analyze what personality traits are preferred by the athletes in relation to the Big Five Dimensions. Design: Cross-sectional survey. Setting: University based, division III athletes. Patients or Other Participants: Ohio Northern University spring athlete volunteers, specifically track and field, baseball, softball, men’s lacrosse, and womens lacrosse athletes. Interventions: Emails to coaches were sent out for times to administer the survey to the athletes. The surveys were given in person along with a consent form for the athletes to sign. The survey consisted of 25 questions using a Likert scale, based off the Big Five Dimensions (Extraversion, Agreeableness, Conscientiousness, Neuroticism and Openness) (John, O.P.). Participants were asked to choose and describe their perception of the type of qualities that would be obtained in an ideal athletic trainer. Main Outcome Measures: The desired traits of an athletic trainer were collected via the in person survey. The data was examined to see any correlations or trends between the sport and the desired traits. Results: Pending. Conclusion: Pending.

“Avoiding the Syntax: An Accessible Approach for Introducing First-year Engineering Students to Microcontrollers”
Paper 6, 12-2 p.m., Wishing Well
Presenters: Will Sierzputowski (Engineering Education), Josephine Palmer (Engineering Education), Tylar Dazey (Engineering Education), Karli Katterle (Engineering Education)
Research Advisor: Todd France (Engineering Education)

At ONU all first-year engineering students complete a two-course introductory sequence, with a subset of learning outcomes emphasizing computational thinking and familiarity with common laboratory and design equipment. A five-day module was introduced to cover basic concepts in programming and circuit design. Starting with procedural instructions, the students learned about inputting data using both analog and digital sensors and outputting data through...
serial communication, lights, buzzers and more. Students were then given time to explore the available components and design their own circuits in an open-ended task. Rather than devoting substantial class time to teaching code syntax, instructors utilized a free online drag-and-drop programming tool to allow students to investigate the logic behind various programs. This approach accelerated the students’ abilities to construct and design working circuits using components from Arduino-based electronics kits. Initial survey findings are positive: significant gains were made in areas related to understanding basic programming structure and logic, breadboarding, reading circuit schematics, and using a microcontroller. Students were also asked to address positive and negative aspects of their experiences; this qualitative data will be analyzed for common themes and salient points to improve upon the activity design in future years.

“Baseline Analysis of Freshwater Lotic Communities Surrounding a Decommissioned Low Head Dam Prior to Removal”
Poster 9, 10:15-11:15 a.m., Activities Room
Presenters: Zachary A. Bragg (Environmental and Field Biology), Everett D. Meredith (Environmental and Field Biology), Tyler T. Tanto (Environmental and Field Biology)  
Research Advisors: Ken J. Oswald (Biological and Allied Health Sciences), Leslie A. Riley (Biological and Allied Health Sciences), Robert G. Verb (Biological and Allied Health Sciences)

Low head dams can create a variety of problems for freshwater lotic communities. We chose to study the Allentown Dam, in Lima, Ohio, which is commissioned for removal in summer of 2019. We designated two study sites, one above the dam and one below, as well as two reference sites for comparison. Within each site, we chose three riffle habitats to sample for macroinvertebrates and periphyton. We also electroshocked for fish in two sites both above and below the dam. We tested for community differences among macroinvertebrates and periphyton with ANOVAs, looking at abundance, taxa richness, diversity, density, and other factors. We also sampled for physicochemical data at each site and compared that data using a Canonical Correspondence Analysis. We found that the two Allentown Dam sites, above and below the dam, are not significantly different from each other in their physicochemical properties, their invertebrate community compositions, or their fish communities. However, the two reference sites were significantly different from each other and the two study sites. Our results point to the idea that the low head dam is not having any localized impact on the lotic benthic community but may be a barrier to fish movement upstream.

“Breadless: Living Without”
Paper 5, 10-11:45 a.m., Wishing Well
Presenter: Soteria Mathewson (Advertising Design)  
Research Advisors: Henry L. Sheets (Art and Design), William Britton Rowe (Art and Design)

Breadless was designed to make a change. This year long, senior capstone research project was stemmed by my goal, to make life easier for people afflicted with gluten allergies or celiac disease; an autoimmune disorder where the ingestion of gluten leads to damage in the small intestine. After a competitor analysis, an online survey, and interviews, I dove into a common, yet hardly known, health issue to bring awareness and lifestyle improvements to the people that are affected by it. A health issue like this is often viewed as detrimental to your financial, social and ‘edible’ life. However, as time progresses, and awareness increases, it is becoming less of a setback in one’s lifestyle. By condensing an abundance of information into one modest and easily accessible site, my designs were intended to encourage awareness and education for the newly diagnosed, as well as help the current partakers with daily lifestyle tasks. The brochure and accompanying advertising campaign are designed to connect to people by highlighting common emotions they might feel upon diagnosis. Through insightful research tactics and a well-developed ideation process, I created a tool that answers the wants and needs of a person adhering to the gluten-free diet.

“Carriers of the Met Allele of the BDNF Val66Met Polymorphism Develop Weaker Fear Memories in a Fear-potentiated Startle Paradigm”
Poster 11, 11:30 a.m.-12:30 p.m., Activities Room
Presenters: Jordan N. Weiser (Psychology – Behavioral Neuroscience), Mackenzie Rene’ Riggenbach (Psychology – General), Leighton E. Wireman (Pharmacy), MacKenzie G. Kaschalk (Molecular Biology), Kassidy E. Reneau (Psychology – Behavioral Neuroscience)  
Research Advisor: Phillip R. Zoladz (Psychology, Sociology, and Criminal Justice)

The val66met polymorphism of the BDNF gene, which is associated with compromised brain-derived neurotrophic factor (BDNF) signaling, impaired synaptic plasticity, and impaired learning, may increase one’s susceptibility to stress- and anxiety-related disorders. Indeed, previous work has reported greater anxiety-related behaviors and impairments of fear conditioning and extinction in individuals who carry the met allele that results from the polymorphism. Because findings in this area of research have been equivocal, we examined the influence of the val66met polymorphism on fear conditioning, extinction, and extinction retention. One hundred and twenty healthy participants completed differential fear conditioning in a fear-potentiated startle paradigm, followed by extinction and extinction retention sessions 24 and 48 hr later, respectively. Participants were genotyped for the val66met polymorphism and divided into met allele carriers and non-carriers. Results revealed a statistical trend suggestive of diminished fear acquisition in met carriers. Most importantly, met carriers exhibited a significantly weaker fear memory than non-carriers 24 hr later, an effect that was particularly evident in female participants and persisted to extinction retention. These results are consistent with previous work demonstrating that the met allele is associated with impaired amygdala-dependent fear learning and extend such findings by demonstrating a sex-dependent component to such effects.

“Changes in Daylight Intensity Alters Gut Bacterial Microbiome of Zoo-housed Patto”
Poster 7, 10:15-11:15 a.m., Activities Room
Presenter: Paige Goodwin (Psychology – Behavioral Neuroscience)  
Research Advisor: Katherine L. Krynak (Biological and Allied Health Sciences)
Zoo-housed nocturnal animals are maintained on a reverse light cycle. However, the exhibit requires red light for viewing, a dark phase light shown to minimize effects on activity. Recent research shows a connection between circadian disturbance, health, and the gut microbiome. Guidelines for illumination of nocturnal primate exhibits are limited, with research focused primarily on the dark phase lighting. To understand the impact of the contrast between dark and light phases, we examined the effect of increasing daylight intensity from 3.3 to 13.5 lumens/ft² in two zoo-housed nocturnal *Perodicticus potto* and examined the bacterial gut microbiome before and after this change. We predicted this increased difference in light intensity would alter the composition of the animals’ gut microbiome. Fecal samples were collected before and after the light intensity change. Gut bacterial communities were examined by sequencing the bacterial DNA. Analysis indicated a significant interaction between change in daylight intensity and the individual animal’s gut bacterial community structure, with both animals having a significant shift in their gut bacterial community structure. Analysis revealed that 14 bacterial taxa were driving the differences between treatments. Future research will examine the potential links between these gut bacterial community changes and potto behavior and health.

“Chemical Stability Evaluations of Sincalide (Kinevac®), a Diagnostic Aid, at Two Different Storage Conditions”
Poster 8, 11:30 a.m.-12:30 p.m., Activities Room
Presenter: Eric Belanger (Pharmacy)
Research Advisors: Yousif Rojeab (Pharmaceutical and Biomedical Sciences), Jeffrey Christoff (Pharmaceutical and Biomedical Sciences)

This collaborative project aimed at evaluating the chemical stability of sincalide at two common storage conditions; room temperature and refrigeration, in an attempt to simulate the conditions faced during centralized reconstitution and subsequent distribution to regional clinical facilities. Sincalide is a peptide hormone product administered parenterally as an aid for diagnostic imaging of hepatobiliary conditions. With an estimated post-reconstitution shelf-life (also referred to as expiration date) of 8 hours (updated by the manufacturer in 2014 without much supporting data) and frequent shortages due to intermittent supply, there is both clinical and economic value in the experimental determination of true chemical stability of this agent. Sincalide was reconstituted and stored at both temperatures (n = 4 each) and samples were collected at predetermined time points. A validated HPLC (high performance liquid chromatography) analytical method was employed for quantification of the active ingredient in these samples. Our findings demonstrated that sincalide remained chemically stable for at least 8 days at both storage conditions. This data supports that from a chemical standpoint, sincalide may possibly be used up to at least 8 days following reconstitution, thus providing convenient and cost-saving benefits to medical institutions utilizing the product.

“Inc Dog Park: A Site Suitability Analysis”
Poster 11, 10:15-11:15 a.m., Activities Room
Presenter: Zachary A. Bragg (Environmental and Field Biology)
Research Advisor: Harry Wilson (Business Administration)

Cincinnati and its greater area suburbs are home to nearly 2,114,580 people making Cincinnati the 29th most populous metropolitan area in the United States, and the third largest metro area in Ohio. An increasing number of the city’s population are dog owners. In 2015, nearly 137,631 unique dogs were registered in Hamilton County which encompasses Cincinnati. Many owners rely on their community to provide a dog friendly atmosphere in specific areas. These include dog parks that are specifically oriented within cities and designed to accommodate owners and dogs. The current research assesses the viability of a dog park in Cincinnati, Ohio. It examines the popularity of dog ownership in the area, and develops profiles of the typical dog owner as well. It also compares the park to be built in Cincinnati to those in the surrounding area and demonstrates how the proposed park will accommodate the local dog-owning market.

“Design and Synthesis of Amine Bis(phenolate) Ligands for Applications in Catalysis”
Poster 17, 12:45-1:45 p.m., Activities Room
Presenter: Claire Griffith (Biochemistry)
Research Advisor: Amelia Anderson-Wile (Chemistry and Biochemistry)

In recent years, interest has grown in the development of organometallic complexes for the polymerization of monomers from renewable resources. Literature evidence shows that amine bis(phenolate) ligands complexed with a variety of metals demonstrate catalytic activity. Our group’s research targets the polymerization of lactic acid to poly(lactic acid) (PLA) using metal complexes bearing variations of amine bis(phenolate) ligands. We are reporting the synthesis and characterization of a novel set of pendant amine bis(phenolate) ligands.

“Determining If Code Blue Simulations Improve Confidence in Acute Care Nurses”
Poster 4, 12:45-1:45 p.m., Activities Room
Presenter: Grant Cayot (Nursing)
Research Advisor: Megan Lieb (Nursing), Nancy Schroeder (Nursing)

Code blue emergency events rely on efficient and confident medical decisions to provide the best possible care to the patient. Exploring ways to increase nurses’ confidence during code situations may not only improve specific code-related skills, but also communication, leadership and teamwork skills. To determine if confidence improved code blue event outcomes, simulation, along with pre- and post-surveys were implemented on an acute care hospital floor. Simulations were run with a nurse educator and followed with a period for debriefing. Simulation was implemented to allow employees to practice code related skills which would in-turn better develop confidence. Code simulations were run at random lasting around 15-20 min. The simulations included on average two to three nurses and multiple assistive personnel.

“Diversity at Ohio Northern University”
Paper 1, 12:1-1:45 p.m., Deans’ Heritage Room
Presenter: Tori Middlebrooks (Communication Studies; Public Relations)
Research Advisor: Mark D. Cruea (Communication and Media Studies)
Post-secondary education has become ingrained into the American culture. In 2015, the U.S. Department of Education found that nearly 27 million students were enrolled in post-secondary institutions. With over six thousand institutions and four million majors and certificates, it is evident post-secondary education has expanded beyond traditional art, math, science, and technology areas of study. Based on current discussions about diversity and high education, college students roles in creating diversity, and the importance of acknowledging and celebrating differences I will be asking the following questions regarding identity and inclusion at Ohio Northern University; What are the students opinion of diversity on ONU’s campus, what are the roles of brave and safe spaces to grow diversity at ONU, and what is the plan moving forward to help improve diversity on campus? I will answer these questions by creating a student survey and hosting a series of focus groups. This qualitative data will be consolidated and analyzed to see what the overall conversation is about diversity and how ONU can move into a more positive direction with this topic.

“Does Self Care Deficit Contribute to Burnout in Nurses?”
Poster 15, 12:45-1:45 p.m., Activities Room
Presenter: Megan Will (Nursing)
Research Advisors: Nancy Schroeder (Nursing), Megan Leib (Nursing)

Nurse burnout is a problem that plagues nurses in all health settings globally. A gap in research still exists regarding factors that influence burnout and its prevention. A descriptive, quantitative study was conducted at a local hospital on the step down unit. A pre education survey was distributed to the staff on the unit by the nurse manager via email. The survey was conducted through SurveyMonkey to ensure privacy. Nurses were then educated about prevention of burnout through the practice of self-care. In this situation, staff were encouraged to utilize a buddy system in order to take a full, uninterrupted lunch away from the floor. A post education survey was distributed and results tabulated. The goal of this study was to evaluate if self-care played a role in preventing nurse burnout and therefore, increase patient outcomes.

“Dramaturgy of Hayavadana”
Poster 19, 11:30 a.m.-12:30 p.m., Activities Room
Presenter: William Hartman (Theatre)
Research Advisor: Joan Robbins (Theatre Arts)

Dramaturgical work is often unrecognized by many theatre attendees. A production dramaturg serves as a resource to the acting company and the production team on the cultural, historic, literary and social background to the play. This involves research into the world of a play, making sure the production is accurate to the world of the play, and of course providing the company with any useful information that informs the design process. In the case of the recent production of Hayavadana, a dramaturg is incredibly useful to the company. As the play was written by an Indian playwright, providing the company with as much context and definition of terms that would otherwise be misunderstood was quite crucial. I collected a great deal of research into a binder full of relevant articles exploring myth, culture, gender, and religious information that helped the cast and crew understand the vibrant culture of India. Informing other students and the general public about a lively culture with vibrant images and stories from Indian myth is important to adding diversity to the campus community. I would present at the colloquium the above stated binder of research, images relevant to the play, and notes on the production process.

“Effects of Different Aerobic Training Techniques on Vital Capacity and Breath Hold”
Poster 3, 10:15-11:15 a.m., Activities Room
Presenters: Luke Fickenworth (Biology), Triet Le (Biology), Jarrod Fair (Biology), Ashlynn Hickey (Biology)
Research Advisors: Vicki Motz (Biological and Allied Health Sciences), Rema Suniga (Biological and Allied Health Sciences)

Athletes involved in soccer and swimming have higher vital capacities and lower respiratory rates than people who do not participate in sports. However, athletes use different techniques to train aerobic endurance. Swimmers use a systematic training that utilizes restricted breathing times, while soccer players have a freer breathing pattern and training style. This study sought to determine whether systematic training (swimmers) is more effective in developing endurance than training used by soccer players. The baseline respiratory rate, breath hold time and vital capacity (adjusted for height) was compared for non-athletes, soccer players, and swimmers (N=10). As expected, swimmers had significantly higher vital capacities (adjusted for height) (66.2 + 10.1) than soccer players (52.9 + 6.93) and non-athletes (52.2 + 10.5). However, no difference was seen in breath hold times between groups. In a follow up study, soccer players and non-athletes will be put into a several week-long swimming training program, then breath hold and vital capacity will be tested to see if the training had an impact. The significance of this study is that systematic training used by swimmers could be an effective way for soccer players and non-athletes to improve their endurance.

“Effects of Host Sex and Ontogeny on the Skin-associated Microbiomes of Acris crepitans”
Poster 6, 10:15-11:15 a.m., Activities Room
Presenters: Gunner M. Stall (Biology), Tyler T. Tanto (Environmental and Field Biology)
Research Advisor: Katherine L. Krynak (Biological and Allied Health Sciences)

The skin-associated bacteria of amphibians provide critical immune defense against pathogens like Batrachochytrium dendrobatidis. Bacterial community composition can be influenced by the genes of the host as well as the environment external to the host (e.g. exposure to chemical pollutants). Our research will assess whether sex and ontogeny of the host influence the composition of these communities on the Cricket Frog (Acris crepitans). We hand-caught 50 Acris crepitans over the course of seven months from a single site in Wood Co., Ohio. From each frog we collected and preserved a skin-swab sample for molecular assessment. Additionally, we collected data on frog snout-vent length and sex. In the laboratory we extracted total DNA from the swabs and amplified the 16S rRNA gene region of bacterial DNA using polymerase chain reaction (PCR). We examined bacterial community composition using terminal restriction fragment length polymorphism analysis conducted on PCR product. Statistical analyses to determine relative effects of sex and ontogeny on bacterial community alpha and beta diversity will be assessed in R using nonmetric multidimensional scaling ordination.
Vasodilators, commonly used to lower blood pressure, increase the diameter of blood vessels, thus decreasing resistance and decreasing pressure. This study investigated whether *Prunella vulgaris* exhibited dose-dependent vasodilation. And if vasodilation was demonstrated was there evidence to support it utilizes an endothelium-dependent vasodilation mechanism via the nitric oxide pathway. Extracts of dried *Prunella vulgaris* flowers were prepared at three concentrations (0.05, 0.10, 0.15 mg of plant material/mL) and administered on isolated renal arteries of *Bos taurus* suspended in jacketed water baths. Vasodilation was measured via force transducer at all doses, for vessels both with and without endothelium. Maximal decrease in contractile force was observed at a dose of 0.05 mg plant material/mL extract which did not differ significantly for endothelium intact (X =0.44 ± 0.97) and disrupted (X=1.2 ± 1.4). A dose-dependent relationship was not observed, indicating that future studies may be done to determine the lowest concentration of *Prunella* that stimulates vasodilation. If *Prunella* proves effective in vasodilation, it might enter the complementary medicine arsenal to treat hypertension, a prominent issue in the United States affecting millions of people.

**“Examining Nonprofit Strategy for Fundraising on a Social Media Platform: A Content Analysis of Top 10 U.S. Nonprofit Power Brands Fundraising Efforts on Facebook, Longitudinal Study Part 2”**

Poster 2, 10-11:45 a.m., Deans’ Heritage Room
Presenter: Michaela Long (Communication Studies; Public Relations)
Research Advisors: Katherine R. Fleck (Communication and Media Studies), Alisa Agozzino (Communication and Media Studies)

Nonprofits continually seek innovative ways to connect with donors. Giving online has changed dramatically in the last decade. While giving online has been accepted by donors as a legitimate tool for giving, the use of social media as a tool for fundraising has not yet become commonplace. In 2016, Dr. Alisa Agozzino, Ph.D., APR Ohio Northern University and Dr. Kathie Fleck, LPD, APR Ohio Northern University applied content analysis to examine three separate quarter samples from 2011-2013 from 10 leading U.S. nonprofit organizations in an effort to provide insight in understanding of the actual use of Facebook as a fundraising tool. It was found that leading nonprofits have adopted the use of Facebook as a communication tool but have not yet embraced the tool for fundraising purposes. The current study will extend the research by applying a content analysis to examine three separate quarter samples from 2016-2018 from the same 10 leading U.S. nonprofit organizations to provide insight on whether or not these organizations have adopted Facebook as a fundraising tool. The current study serves as an extension to create a longitudinal study on the evolution of the use of Facebook by these leading U.S. nonprofit organizations to raise funds.

**“Exploration of Non-symmetrical Amine Bis(phenolate) Ligands Using a Combined Synthetic and Computational Approach”**

Poster 19, 12:45-1:45 p.m., Activities Room
Presenter: Nicole Braunscheidel (Chemistry)
Research Advisors: Bradley M. Wile (Chemistry and Biochemistry), Trilisa Perrine (Chemistry and Biochemistry)

Non-symmetrical ligands may facilitate the formation of enantio-enriched substrates by virtue of their binding to catalytically-active metals. We propose to generate a series of non-symmetrical amine bis(phenolate) ligands with varied steric bulk and electron donating or withdrawing substituents. Computations are being completed in addition to synthetic methods to model these systems. In efforts to accurately computationally model the scheme of ligands, density functional theory is utilized to determine geometries and energies for resultant d5 metal complexes.

**“Focusing in on Training Upcoming Academicians: Interviews of Pharmacy Resident Teaching Certificate Leaders in Ohio”**

Poster 4, 11:30 a.m.-12:30 p.m., Activities Room
Presenter: Karielle Shaffery (Pharmacy)
Research Advisors: Brittany Long (Pharmacy Practice), Emily Eddy (Pharmacy Practice), Lindsay Peters (Pharmacy Practice)

**Background:** There is a lack of standardization and published research on what content and requirements should be included within residency teaching certificate programs to best prepare residents for a career in academia. The objective of this project is to better identify and compare how residency teaching certificate programs are structured in Ohio.

**Methods:** Ohio RTCP coordinators were contacted via email and asked to participate in an IRB-approved interview, either in-person or telephonically. Standardized questions were developed focusing on six categories: demographics/background, administration/logistics, content, resident assessment, financing, and continuous quality improvement. Interviews were recorded, documented, and coded. Data was analyzed and reported in aggregate form.

**Results:** All seven colleges were interviewed, representing 136 RTCP participants this year. Logistics including scheduled meetings, content covered, required activities, and faculty involvement were not consistent. One consistency is all programs require a teaching portfolio and completion, rather than demonstrated competency, of required activities. Program finances varied; 29% of RTCP pay the residency programs and 14% get paid. Program assessment ranged from no routine assessment to grant-funded quality improvement, with most programs lacking annual programmatic review. Six programs (86%) expressed interest in developing a standard set of requirements and in increasing collaboration across RTCPs.

**“Force Propagation in Composite Drumsticks”**

Poster 24, 11:30 a.m.-12:30 p.m., Activities Room
Presenter: Bradley Lockhart (Physics – Physics)
Research Advisor: William Fuller (Mathematics and Statistics)

Multi-rod drumsticks are close-packed circular arrays of individual rods. We consider the problem of how an initial impulse propagates through such an array. As a first approximation we model the drumstick as a square array of cells and develop a set of discrete-time two-dimensional recursion relations to model the force propagation. The relations can be recast in matrix form as \( A_n = \sum_{j=0}^{\infty} \binom{n}{j} p/A_0^n \).

“Gender Differences in Lethal Force Decision-making”
Poster 13, 11:30 a.m.-12:30 p.m., Activities Room
Presenter: Mackenzie Rene’ Riggenbach (Psychology - General)
Research Advisors: Adam Biggs (Naval Medical Research Unit Dayton), Kyle Pettijohn (Naval Medical Research Unit Dayton), Kara Blacker (Naval Medical Research Unit Dayton)
ONU Sponsor: Phillip R. Zoladz (Psychology, Sociology, and Criminal Justice)

The present study investigated gender differences in lethal force decision-making for both the gender of the shooter and the gender of the target by having participants complete a shooting-based go/no-go task. Participants fired a simulated Beretta M9 pistol at both male and female images of hostiles and non-hostiles on an Indoor Simulated Marksmanship Trainer (ISMT). Results indicated that participants respond faster to female targets compared to male targets. However, there were no differences in RT due to the gender of the shooter. The role of novelty and perceived threat as potential mechanisms for this effect are discussed.

“Identifying Communication Gaps between Care Coordinators and Physicians”
Paper 3, 12:1-1:45 p.m., Deans’ Heritage Room
Presenter: Madison Essinger (Communication Studies)
Research Advisor: Mark D. Cruea (Communication and Media Studies)

The author describes how hospital care coordinators process of communicating with other care providers and patients in a healthcare system can be a complex challenge. Effectively communicating physician to physician, and physician to patient at hospitals contributes to the safety of the environment as well as the development and healing for the patient. However, effectively communicating is one of the most consistent problems in healthcare. This can be due to communication gaps between physicians and patients when communicating on patient care plans during their stay and after. Preventing avoidable readmissions and error in care, has the potential not only to improve the quality of life for patients, but also improve the economic state of hospitals and provider-patient satisfaction. Through observation, the goal of this case study is to identify these gaps existing between physicians and patients at Lima Memorial Health System. Findings observed will then be compared to Crew Resource Management Theory. This theory of training procedures followed to eliminate error, was first used to train pilots and is now being applied in many high-risk professions. This theory can be applied in correcting communication gaps among the LMHS team by improving interpersonal communication and decision making.

“Immediate Pre-learning Stress Enhances Fear Acquisition and Delays Long-term Extinction in a Fear-potentiated Startle Paradigm”
Poster 12, 11:30 a.m.-12:30 p.m., Activities Room
Presenters: Mackenzie Rene’ Riggenbach (Psychology - General), Jordan N. Weiser (Psychology - Behavioral Neuroscience), Leighton E. Wireman (Pharmacy), MacKenzie G. Kaschalk (Molecular Biology), Kassidy E. Reneau (Psychology - Behavioral Neuroscience)
Research Advisor: Phillip R. Zoladz (Psychology, Sociology, and Criminal Justice)

Stress immediately before learning enhances long-term declarative memory, while stress that is temporally separated from learning impairs long-term declarative memory. We extended these findings by examining the impact of immediate, pre-learning stress on fear conditioning, extinction, and extinction retention. One hundred and forty-one healthy participants underwent a stress (socially evaluated cold pressor test) or control manipulation immediately before completing differential fear conditioning in a fear-potentiated startle paradigm. Participants then completed extinction and extinction retention sessions 24 and 48 h later, respectively. Stress administered immediately before acquisition enhanced fear learning, evidenced by greater fear-potentiated startle to the CS+ and greater CS discrimination. Although no group differences were observed during extinction training, stressed participants exhibited evidence of impaired extinction retention 48 h after training. Importantly, stressed participants’ cortisol responses to the stressor on Day 1 were positively associated with fear-potentiated startle and CS discrimination during extinction and extinction retention. These findings suggest that stress immediately before fear conditioning results in a more enduring fear memory, perhaps via corticosteroid activity. Such a paradigm could be useful for understanding factors that influence traumatic memory formation.

“Increasing Visibility of Restricted Limbs”
Poster 13, 12:45-1:45 p.m., Activities Room
Presenter: Nicole Michalek (Nursing)
Research Advisor: Nancy Schroeder (Nursing)

Patients in the hospital have their blood pressures taken with a blood pressure cuff multiple times a day, as part of routine patient care. Patients with limb restrictions require caution when obtaining blood pressures and venipunctures in the affected limb. Limb restrictions can be defined as when a patient has a preexisting condition where performing blood pressure checks or venipuncture could cause potential injury in a certain extremity. Hospital nursing units relay limb restriction information differently. The aim of this study is to assess the current method of limb restriction communication and evaluate an alternative intervention which increases the visibility of limb restrictions, and patient safety. Pre-surveys were electronically distributed to assess the current method for limb restriction communication. An alternative intervention for communicating limb restrictions was devised and implemented for 10 days. This implementation consisted of securing a limb restriction sign to a patient’s gown on the side of said restriction. The color of the sign also varied to determine its effect on visibility of the restriction. A post-survey was distributed to then evaluate the new intervention. The goal
of the intervention is that new signs will increase the visibility of limb restrictions, thus, decreasing related injuries.

“Intensive Care Nurses’ Perceptions of Modified Bedside Shift Report”
Poster 14, 12:45-1:45 p.m., Activities Room
Presenter: Hannah Price (Nursing)
Research Advisor: Nancy Schroeder (Nursing)

Evaluation of end-of-shift communication on an intensive care unit (ICU), determined that a modified version of bedside end-of-shift report could improve the effectiveness of communication among nurses during the transition of care. A literature search of evidence-based practice suggested that moving report to the bedside had many benefits for both patients and nurses. This quality improvement initiative explored the perceptions of ICU nurses on the implementation of a modified bedside shift report and its impact on patient safety, patient satisfaction, and nurse satisfaction as compared to a traditional end-of-shift report. A pre- and post-Likert scale survey was administered to identify themes based on the nurses’ perceptions. It is anticipated that the findings will reflect the literature and lead to perceptions of increased patient safety, patient satisfaction, and nurse satisfaction.

“Life Coaching and Social Media”
Paper 1, 10-11:45 a.m., Deans’ Heritage Room
Presenter: Tori Middlebrooks (Communication Studies; Public Relations)
Research Advisor: Shane Tilton (Communication and Media Studies)

In life, we always looking for ways to improve ourselves and become more in what we do. One way in which people have successfully done this is through life coaching. The concept of life coaching came from the idea of having a sports coach; just as we use coaches to better us in sports, we can use them to help us live a more fulfilling life. Over the past couple of decades, social media has become more and more available to us, thus innovating the way life coaching is conducted. Today more and more coaches are earning their income with the use of popular social media tools such as Facebook, FaceTime, Instagram, and Twitter. The purpose of this research is to learn how effective online coaching. The question that will be asked is, how can social media increase the effectiveness of life coaching. This question will be answered by looking at how effective online coaching truly is.

“Manufacturing Work Cell”
Poster 2, 12:45-1:45 p.m., Activities Room
Research Advisors: Joseph Ekong (Technological Studies), Richard Miller (Technological Studies)

The Department of Technological Studies of Ohio Northern University has formed a team of five of its manufacturing technologists to take on the BYOB (Bring Your Own Bot/Build Your Own Bot) National Robotics Challenge. After extensive brainstorming and discussion, the group decided to put forward their intent of designing a manufacturing work cell that is capable of manufacturing Ohio Northern University labeled drink coasters. The work cell will operate as follows. The group is working with one EMCO CNC Mill and one ABB Robotic Arm. By using pre-manufactured lasered out 3 1/2" x 3 1/2" x 1/4" pieces of wood as their material (coaster blanks), the team will program the ABB Robotic Arm to take a lasered out piece of wood, one piece at a time, from a loading rack, and place it within the EMCO CNC Mill. The EMCO CNC Mill will then be programed with G-Code to machine out an Ohio Northern University logo into the piece of wood. At the end of the machining process, the ABB Robotic Arm will retrieve the coaster from the EMCO CNC Mill. The ONU coasters will then be quality checked by the human eye and packaged in a coaster box.

“Mom and Pop’ Shops, Social Media and College Students”
Paper 4, 12-1:45 p.m., Deans’ Heritage Room
Presenter: Emily Kristine Fergus (Communication Studies; Graphic Design)
Research Advisor: Mark D. Cruede (Communication and Media Studies)

This study will analyze the effect of a social media presence on college students’ awareness of small businesses. In a community largely made up of college students there is a large financial opportunity if students are aware of the services and businesses offered to them. This research will analyze the effect of a social media presence on college students’ awareness of small businesses using a survey and focus group. The survey method will be used to gather quantitative data on ONU students’ awareness of businesses and the focus group will analyze the qualitative elements that shape this awareness. Together these tactics should provide an explanation of what online content reaches students best. The conclusions made could be very beneficial to local businesses. The results of this research may reflect trends, but will be catered to small businesses in Ada. For those owners there should be an accurate reflection of how important an online presence is for their establishment. When owners look at all of their responsibilities this information can help them decide how much of their time and resources they should invest on their social media. If taken and considered, this could make a large difference for area commerce.

“Mother Goose Suds: Brand Development”
Paper 4, 10-11:45 a.m., Wishing Well
Presenter: Alexandra N. Gesler (Advertising Design)
Research Advisors: Henry L. Sheets (Art and Design), William Britton Rowe (Art and Design)

I created and promoted a soap brand that parents feel comfortable using on their children. Mother Goose Suds is a brand that focuses on the whimsical aspects of nursery rhymes while containing all natural, organic ingredients. I target parents and grandparents of young children who hope to make their child’s nightly bath routine more enjoyable and memorable. This whole idea came from just brainstorming a concept that would be fun for kids. I researched other brands who thrive in the business of natural soaps. Lush is one of the brands that inspire me. Their brand values help me set my own brand values for Mother Goose Suds. The packaging for the products are individually inspired by a nursery rhyme. The
patterns are lively and exciting. The packaging inspires an enjoyable bath time routine. To develop this brand, I conducted an interview and competitive analysis. My brand is like nothing currently in stores. It is natural, organic, affordable, includes unique packaging, and is enjoyable for children. The brand will continue to grow in products, promotion, scents, and more. This brand will thrive in the natural soap market.

“New Business Startups in Kenton, Ohio: A Geospatial Analysis”
Poster 17, 10:15-11:15 a.m., Activities Room
Presenter: Spencer Stites (Management)
Research Advisor: Harry Wilson (Business Administration)

Starting a new business can be very daunting. Success relies on many things, including location, existence of a customer base, and marketing. The current research examines Kenton, Ohio, and its potential for a business startup. We use common geospatial analysis techniques to examine the city’s demographics, spending and saving habits. We then propose certain new business types that would do well in Kenton. Finally, we suggest certain locations for new business startups.

“New Gas Kinematics for the Pseudobulge Galaxy NGC 1291”
Poster 20, 11:30 a.m.-12:30 p.m., Activities Room
Presenter: Justin Chapman (Physics - Astronomy)
Research Advisor: Jason Pinkney (Physics and Astronomy)

We present new stellar and gas kinematics for the (R)SB(s)O/a galaxy NGC 1291 derived from long-slit spectroscopy taken with a Magellan 6.5-m telescope. Previously published stellar kinematics exist. This galaxy is of interest as it has an outer ring and both an outer bar and an inner bar. Also, it is a prototypical “pseudobulge.” Pseudobulges differ from classical bulges in that they have supposedly formed out of gas inflow from the disk of the galaxy over an extended time period. Our gas kinematics are not what we would expect from this hypothesis. They show a very asymmetric rotation compared to the stellar component, i.e., the gas is decoupled from the stars.

“Nurse Staffing Ratios and Patient Safety”
Poster 11, 12:45-1:45 p.m., Activities Room
Presenter: Colleen Grainger (Nursing)
Research Advisors: Nancy Schroeder (Nursing), Megan Lieb (Nursing)

Registered nurses have expressed feeling overwhelmed and unhappy while working in acute care settings. Patient safety also remains a concern. California implemented nurse-to-patient-ratio legislation with the intention of improving patient outcomes. After a review of literature was conducted, surveys were administered to registered nurses on a critical care floor to assess the direct relationship between nurse staffing ratios and patient safety, nurse job satisfaction and quality of care. Then the group was educated on how to contact their representative to express their opinions regarding the bill in congress to mandate nurse to patient ratios nationally. After, a post survey was administered to measure the effectiveness of the teaching. These results were studied to improve work conditions for nurses in this setting and the impact it has on patient outcome.

“Nutrition and the Distance Runner”
Paper 1, 10-11:45 a.m., Wishing Well
Presenter: John McNutt (Graphic Design)
Research Advisor: Henry L. Sheets (Art and Design)

Not only is design a huge part of my life, but distance running is as well. As I started to become faster, I found it harder to drop considerable increments of time with logging miles only. I spoke with my coach and the one thing that he said would help me make my step to the next level: nutrition. I and other runners here at Ohio Northern were unsure how to properly fuel our bodies and did not realize how certain foods could benefit/harm our performance. Also, being on the meal plan here at Ohio Northern made it difficult to receive such nutrition because my diet was restricted on what was being served. Thus, I sought to create a system where runners could find information on what foods to properly eat by doing research on how runners should properly fuel their bodies, then giving them access to that information easily by designing a website and having our coach send what we should eat daily from Mac along with our workouts. Then by using running log apps the team uses as a basis, I created an app that allows the XC team to log their meals daily.

“Oral Care Compliance to Lower Infection Rates”
Poster 10, 12:45-1:45 p.m., Activities Room
Presenter: Kathleen S. Miller (Nursing)
Research Advisors: Stacey Pernia Groll (Nursing), Megan Lieb (Nursing), Nancy Schroeder (Nursing)

Ventilator Associated Pneumonia infections continue to be a significant problem in intensive care units. There is a vast amount of literature to verify this claim. When a patient develops this infection it increases their risk to have subsequent adverse consequences. Studies have been conducted to evaluate the presence of these infections but there is variability in the compliance rate of nurses on these units. This study evaluated compliance rates on an 18 bed pediatric intensive care unit (PICU). There was a pre-survey conducted to determine compliance with preforming oral care and changing the suction caps as a way to prevent infections on ventilated patients. After that survey was released for a week, there was new intervention posted. This consisted of a notecard-sized paper posted in each room that had written and visual reminders to complete infection prevention protocols. The information remained posted for two weeks and then a post-intervention survey was conducted. This survey looked at compliance rates with the addition of the visual reminder. It was expected that the compliance rates would increase after the implementation of the visual reminder. This increase in compliance should help aid in the reducing of pneumonia infection acquired in the PICU.

“Peripheral Intravenous Catheter Infections”
Poster 16, 12:45-1:45 p.m., Activities Room
Presenter: Brenna Dee (Nursing)
Research Advisor: Nancy Schroeder (Nursing)

Objective: The quality improvement project evaluated the perceptions and knowledge of the nurses on a post-surgical ortho, colorectal unit about a new protocol regarding intravenous catheters. Subjects and Methods: A voluntary, six-question Likert-style pre-post survey was completed by day and night shift nurses. Results: Evidence will be evaluated
Comparing nurses’ perceptions of competency regarding starting an intravenous line, checking patency per policy, and identifying phlebitis. Survey outcomes will be measured and can guide future educational offerings for the staff nurses.

**Conclusion:** It is expected that nurses’ levels of self-reported compliance with the new policy will increase.

**“Pharmacy Student-led Pre-visit Medication Reviews”**
Poster 1, 11:30 a.m.-12:30 p.m., Activities Room
Presenters: Jordan G. Hughes (Pharmacy), Brandon Kasberg (Pharmacy), Alexandra Latala (Pharmacy), Emily Howell (Pharmacy)
Research Advisor: Michelle R. Musser (Pharmacy Practice)

**Introduction:** Data suggests pharmacist-led pre-visit medication evaluations improve patient care. Additionally, medication-related adverse events and appropriate allergy documentation are often not identified by the clinicians. Pharmacy students have knowledge to impact patient care via pre-visit medication reviews, especially in rural, underserved areas. **Objectives/purpose:** To evaluate medication-related problems, concerns, and discrepancies (PCD) and corresponding interventions identified by pharmacy students performing pre-visit medication reviews. The impact of pre-visit medication reviews on patient care including appointment time will also be assessed. **Methods:** Pharmacy students will be trained and supervised by faculty on the study procedure and review and documentation procedures. Patients seen at a primary care physician’s office will be called by a pharmacy student in the week prior to their next appointment. The student, following a template, will conduct a patient interview and perform a medication review. The pharmacy student will counsel the patient as needed, answer any questions, and provide recommendations to the provider. Outcomes regarding the impact of the service will be gathered including appointment show rates, PCD identified, interventions recommended/accepted, and provider/patient satisfaction.

**Results/Discussion:** The study is in progress; project initiation planned in Fall 2019.

**“Philosophy of Leadership and Making an Ethical Decision”**
Paper 5, 10-11:45 a.m., Deans’ Heritage Room
Presenter: Ahlam S. Anteer (Biology; Philosophy, Politics and Economics)
Research Advisors: Mark H. Dixon (Philosophy and Religion), Catherine Albrecht (History, Political Science, and Geography)

My paper is shaped around the philosophy of leadership and making an ethical decision. I try to define the leadership or find a fit definition that is generally acceptable. I believe that leadership is determined by the way people in the culture use it and think about it. I examined three styles of leaders who already were in power. The method that I used is to examine their history including their childhood, their educational backgrounds, their impact on the World, their beginnings as leaders or politicians, their involvement as leaders in real lives, their decisions, and the consequences of their leadership. The result is: there is a strong relationship between critical thinking and ethical decision making in the workplace. Critical thinking is a learned behavior; it stands to reason that everybody has the ability to enhance his/her skills. I conclude that a skilled leader is able to create many ways to reshape the right balance between power and ethics. Leaders today, need to be equipped with the necessary tools to resolve complex ethical dilemmas as well as good intentions. The greatest way that one can inspire others to change is by making changes to oneself first. By practicing the process of leadership to become a confident leader of oneself then one can get the confidence of others.

**“Pilot Testing a Virtual Reality-based Intervention for Irritable Bowel Syndrome”**
Paper 2, 12-2 p.m., Wishing Well
Presenter: D. Josh Mohn (Biology; Public Health)
Research Advisor: Ross M. Kauffman (Interdisciplinary Studies)

Irritable Bowel Syndrome (IBS) affects as many as one in five people in the United States and is a syndrome that has no clear treatment or cure. Previous studies have demonstrated the value of hypnotherapy in treating some of the symptoms of IBS, with an emphasis in abdominal pain. These studies have demonstrated that positive effects of hypnotherapy are long-term, continuing over an observed 18-month period. Virtual reality is a possible platform through which hypnotherapy can be more cost-effectively delivered with the same results. Virtual reality-based hypnotherapy has been effective in treating burn victim pain and has been shown to be more effective than recorded audio alone. As public opinion is turning in favor of hypnosis and hypnotherapy, more clinical interventions should be aimed to utilize the technology. This study pilot tested a virtual reality-based hypnotherapy intervention designed to treat the symptoms of IBS. The effect of the intervention on mood, motion sickness, level of relaxation, and immersion were measured in a non-clinical sample. Qualitative responses were collected to determine what is working well and what needs to be improved. Pilot results will be used to refine the virtual reality IBS intervention before testing in a clinical population.

**“Poke: Mindfulness Made Fun”**
Paper 6, 10-11:45 a.m., Wishing Well
Presenter: Emily Kristine Fergus (Communication Studies; Graphic Design)
Research Advisors: Henry L. Sheets (Art and Design), William Britton Rowe (Art and Design)

Poke is an app designed for children ages 6 to 8 dealing with any form of anxiety. A digital application is ideal for an issue like this because it enables the child to learn independently, anywhere. This means a child with divorced parents and separation anxiety can spend some time on Poke and feel more comfortable in a new environment. Or a child with social phobias can excuse themselves to the back of their classroom at school and calm down without having to leave the class setting or cause a disruption. In addition to the app, Poke also features materials to help inform parents and teachers. Informational materials explain the activities children can do and how the adults in their lives can help with the process to make them more successful. All of this aims to do one thing: show adults what the child is experiencing so they can understand what they’re feeling and how they can help them through it. All of this was created to help educate children and adults about the importance of understanding feelings because the more that society recognizes the significance of emotional health, the better our overall wellbeing can be.

**“Politics of Awards/Blockbuster Films in the 21st Century”**
Paper 3, 10-11:45 a.m., Deans’ Heritage Room
“Preparation of Manganese Complexes of Amine Bis(phenolate) Ligands”
Poster 20, 12:45-1:45 p.m., Activities Room
Presenter: Nathaniel C. McCutcheon (Chemistry)
Research Advisor: Bradley M. Wile (Chemistry and Biochemistry)

We have previously reported the preparation of K² and K³ amine bis(phenolate) complexes of Pd(II). In an effort to extend this chemistry to more abundant base metal variants, we sought to prepare manganese complexes with the same ligand class. Manganese complexes with similar ligands are often found in trimeric or multimeric forms, containing many Mn centers bridged by oxo ligands. We look to add to a small body of work that investigates the synthesis of monomeric Mn complexes using similar amine bis(phenolate) architectures with bulky substituents.

“Progress toward Methanesulfonic Acid Analysis in the Marine Environment”
Poster 24, 12:45-1:45 p.m., Activities Room
Presenter: Sarah K. Jones (Chemistry)
Research Advisor: Christopher E. Spiese (Chemistry and Biochemistry)

Methanesulfonic acid (MSA) is a key piece of the global sulfur cycle. Despite its importance analysis of MSA in marine waters is difficult due to the background ionic strength. We aimed to develop a method to detect and quantify MSA. Initial work was performed using ¹H NMR techniques to verify reduction and extraction steps. Later, a GC-MS method was adapted from literature to derivatize MSA to a sulfonamide analog. While MSA was identifiable on the GC-MS, quantification was difficult due to low extraction from water. Additional routes to derivatization included S₂O₂ reaction using benzylbromide. To date, clear unambiguous detection and quantification of MSA remains a goal.

“Putting Money Where Your Mouth Is: A Media Analysis of Online Betting Markets”
Paper 4, 10:11:45 a.m., Deans’ Heritage Room
Presenter: Seth M. Ferguson (Political Science; History)
Research Advisors: Robert Alexander (History, Political Science, and Geography), Robert Waters (History, Political Science, and Geography)

Public opinion polls are omnipresent in the media coverage of political campaigns. Journalists frequently cite polls in their forecasts of political contests. Scholars have sought to understand how polls are used by journalists as well as the concomitant effects of their usage. Rosenthal finds that media coverage of polls typically has little to do with examining their accuracy. Instead, he argues that polls are often used to fill air time and serve as a means to satiate the news consumers need for a constant flow of new information. Recently, prediction markets have gained increasing attention among political observers. Stories examining betting markets (such as PredictIt) have been prominently featured in news stories covering elections. However, little scholarly research exists detailing this coverage. This paper seeks to fill this void by examining all published news articles mentioning PredictIt since its creation. This research provides an important baseline to examine media usage of political betting markets and illustrates what journalists tend to focus on relative to this phenomenon.

“Recovery”
Paper 7, 10:11:45 a.m., Wishing Well
Presenter: Kevin Cook (Graphic Design)
Research Advisors: Henry L. Sheets (Art and Design), William Britton Rowe (Art and Design)

My project was inspired by personal experience. In May of 2018 my mother had a stroke. Being twenty-three years old, I had never experienced all the responsibilities I was forced to take on when this happened. I was bombarded with words I’ve never heard, bills I’ve never had to pay, and legal documents and processes that are hard even for someone in their fifties. Topping it all off, I had no clear guidance on what needed to...
be done other than an outlandishly large pile of paperwork dropped on the desk from the social worker. Business cards, legal documents, and poorly designed info sheets stacked two inches tall, reading like a phonebook. This was overwhelming for someone my age and I couldn’t imagine others going through the same process. This inspired my capstone. I created a guide book for people my age, going through what I did, called “Recovery.” It lays out the essentials of what to do in similar situations and explains everything from important questions to ask, to the legal process of Power of Attorney. I have turned that stack of unorganized paper, that others like me are given, into a manageable book that is easy to read.

“Reducing Medical Waste on a Neurology Unit”
Poster 6, 12:45-1:45 p.m., Activities Room
Presenter: Courtney Michelle Niesen (Nursing)
Research Advisors: Leslie Bostick (Nursing), Nancy Schroeder (Nursing)

Unused, wasted medical supplies pose an astronomical cost to hospitals and a factor in the increasing cost of healthcare. The purpose of this quality improvement study was to evaluate the perception that pediatric neurology nurses and patient care assistants have about wasted supplies on their unit and their habits involving the supplies. This project consisted of a pre-survey/post-survey design on the staff’s perception of the waste on the unit. After the pre-survey, all the unused items from patients’ rooms after discharge, which are usually thrown away, were collected for an entire week. An email was then sent describing the waste and the cost of each supply, along with a post-survey mimicking the pre-survey to re-evaluate the staff’s perception of the waste. Collecting the wasted unopened supplies on the unit will create an awareness of the amount of waste and it’s cost to the unit. The results of this project will hopefully be a reduction in the amount of wasted unused medical supplies on the unit and an increase in the staff’s understanding of this issue.

“Re-education Techniques for Pain Management”
Poster 8, 12:45-1:45 p.m., Activities Room
Presenter: Kelsey Kerr (Nursing)
Research Advisors: Megan Lieb (Nursing), Nancy Schroeder (Nursing)

My project will be determining the knowledge and amount of pain education nurses are giving to post-op patients on an Orthopedic/Med-Surg floor. Existing literature states that nurses have inadequate assessments leading to uncontrolled pain which hinders patient progress by prolonging their hospital stay or, increasing their risk for future readmission. To fully understand how to achieve proper pain management, the selected literature in this paper seeks to identify the proposed study question: How does re-education of pain management techniques impact perceptions of competency in orthopedic nurses? To determine proper education material, a paper pre/post survey will be distributed to day/night shift nurses that will give their perception of how much education is happening regarding pain management. The results will be assessed, and a script for pain education will be formed. The nurses will use this script on patients while doing hourly rounds or shift report. After the intervention, the post survey will be given, and the results will conclude that the intervention increased education on pain management and proper use of pain medications. In the end, the scripting will increase the education process, so patients are aware on how their pain will be managed properly after their surgery and increase patient awareness of post-op pain.

“Regulation of Exchange Protein Directly Activated by cAMP (EPAC1) by Hypoxia in Human Endothelial Cells”
Poster 7, 11:30 a.m.-12:30 p.m., Activities Room
Presenters: Alexis Nicole Dayton (Pharmacy), Alexander Nixon (Pharmacy), Richard Morris (Pharmacy)
Research Advisor: Mark Olah (Pharmaceutical and Biomedical Sciences)

At 48 hours of hypoxia, EPAC1 expression was 53.9 ± 7.4% of that in normoxic cells. To determine if this decrease in expression of EPAC1 had functional consequences, Rap1 activation assays were performed. In normoxic HMVEC, the EPAC1-selective activator 8-CPT-cAMP induced a 3.4 ± 1.1-fold increase in Rap1 activity. In hypoxic cells, the effect of 8-CPT-cAMP was significantly reduced to a 2.1 ± 0.7-fold stimulation of Rap1. Hypoxia did not significantly affect Rap1 expression or basal activity. Currently, we are examining if hypoxia regulates the ability of EPAC1 activation to inhibit pro-inflammatory effects of cytokines such as TNF-α and IL-6.

“Rhetorical Analysis of Bethesda’s Todd Howard and His E3 Presentation”
Poster 7, 12-1:45 p.m., Deans’ Heritage Room
Presenter: Michael D. Schroeder (Communication Studies)
Research Advisor: Mark D. Cruea (Communication and Media Studies)

One of the largest forms of entertainment in recent years is the gaming industry. Research on the gaming industry has been happening since the 90s. According to Sinclair (2018) of Gaming Industry Business, the gaming industry globally made about 121.7 billion dollars in revenue in 2017 which is a big growth from the 93.18 billion dollars made in 2015. To narrow down the research we need to look at how they market the games. The gaming industry has social media, commercial advertising, and one of the most important all the gaming conventions done every year. One of the biggest conventions in the US is the Electronic Entertainment Expo better known as E3. At E3, hundreds of electronics companies come to show off their brand-new products. Bethesda is one of these companies that goes to E3 to show off their new video games. One of the most well-known developers for Bethesda has been Todd Howard. He has developed well-known games like Fallout 3, Fallout 4, and Elder Scrolls: Skyrim. Howard presented at E3 in 2018 for the Fallout 76. To better understand the presentational methods used by Howard, the following research questions were developed: What rhetorical devices were used by Todd Howard at the 2018 E3 presentation for Fallout 76, and based on the previous question, how successful was Todd Howard’s presentation?

“Risky Behaviors Associated with Contact Lens Use”
Paper 3, 12-2 p.m., Wishing Well
Presenter: Moko Tanaka (Public Health)
Research Advisor: Ross M. Kauffman (Interdisciplinary Studies)

The use of contact lenses is known to increase the risk of several eye infections due to increased microbial load. It also can cause microbial keratitis, the most serious eye problems associated with the eyesight. Typical behaviors that are
associated with the risk of eye disease and discomfort are infrequent cleaning of lenses and lens cases, inappropriate replacement schedules for lenses and lens cases, insufficient handwashing, exposure to water, and over-wearing or sleeping in lenses. This study employed a cross-sectional design to gather quantitative data on contact lens risk behaviors from ONU students. An online survey was administered to contact lens wearers identified via a mailing to the student listserv. This strategy was used to increase reach and minimizes both participant and investigator burden, while allowing participants to respond anonymously. The survey aims to determine the most prevalent risky behaviors to provide the basis for an intervention to reduce the risk of eye disease associated with modifiable risk behaviors. Descriptive data on risky contact lens behaviors among ONU contact lens wearers will be presented, and their implications for strategies to reduce the risk of eye disease and discomfort on campus will be discussed.

“Rodent Model of PTSD and Accompanied Changes in the Gut-associated Microbiome”
Poster 14, 11:30 a.m.-12:30 p.m., Activities Room
Presenter: Ian F. Smith (Psychology - Behavioral Neuroscience)
Research Advisors: Katherine L. Krynak (Biological and Allied Health Sciences), Phillip R. Zoladz (Psychology, Sociology, and Criminal Justice)

Recent research has established a relationship between physiological responses to stress and the gut-associated microbiome and that changes in the makeup of the gut-microbiome may lead to anxiety-like symptomatology. However, work concerning how specific anxiety-related illnesses may influence the microbiome is limited. The purpose of this study was to observe changes in the gut-associated microbiome of Sprague-Dawley rats with induced post-traumatic stress disorder (PTSD)-like symptomatology. We hypothesized that exposure to stress would lead to a significant change in the composition of the gut-microbiome. Male rats were exposed to a well-verified 31-day PTSD paradigm consisting of two exposures to a cat (each exposure separated by 10 days) and daily social instability. Ten rats underwent the stress model, and 10 rats served as controls. All rats underwent behavioral testing to assess anxiety-like behavior. DNA was extracted from fecal samples from all rats. Polymerase chain reaction (PCR) was used to amplify the 16S rRNA gene region of bacterial DNA and terminal fragment length polymorphism (TRFLP) analysis was used to assess differences in gut-microbiome composition across treatments. It was predicted that behavior and the gut-microbiome composition would be similar across treatments before the PTSD paradigm and would significantly differ following exposure to stress.

“Role of RGS4 Proteins in Reward”
Poster 6, 11:30 a.m.-12:30 p.m., Activities Room
Presenters: Sara A. Asswini (Pharmacy), Madison Rose (Biology, Mount Vernon Nazarene U), Nathaniel H. Emerson (Biology), Sara Seeley (Pharmacy)
Research Advisors: Manoranjan S. D’Souza (Pharmaceutical and Biomedical Sciences), Boyd R. Rorabaugh (Pharmaceutical and Biomedical Sciences)

Drug addiction is a major burden on every society today due to the loss of life, health-care and crime-related costs and loss of productivity associated with it. Identification of specific neural substrates in the brain reward pathway, which mediates the reinforcing effects of all drugs of abuse, will help in developing new drugs to treat drug addiction. The brain reward pathway primarily consists of dopaminergic neurons, which originate in the ventral tegmental area and terminate in the nucleus accumbens. In addition to dopamine, other neurotransmitters such as serotonin, glutamate and GABA are also involved in mediating the rewarding effects of drugs of abuse such as nicotine and cocaine. The goal of this project is to determine the role of the regulator of G protein-signaling (RGS) 4 protein 4 in the rewarding effects of drugs of abuse and natural rewards. RGS4 protein negatively modulate signaling pathways of G protein-coupled receptors (GPCRs), which mediate the effects of several neurotransmitters such as dopamine, serotonin and glutamate. However, the role of RGS 4 proteins in mediating the rewarding effects of nicotine, cocaine and food has not been investigated. The project will utilize genetically-modified male and female mice and conditioned place preference model to assess the role of RGS4 proteins in the rewarding effects of nicotine, cocaine and food. Further, the effects of the aforementioned rewards will be assessed in both males and female mice. The data are currently being evaluated.

“Seasonal Affective Disorder (SAD), Physical Activity, and Nutrition”
This study seeks to propose a health intervention on a small, Midwestern university campus in order to help alleviate the symptoms of Seasonal Affective Disorder (SAD), or other depression-like disorders on campus. **Methodology:** Participants are undergraduate students between the ages of 18 to 22. Law students, fifth and sixth year pharmacy students are excluded from the study due to being part of graduate programs. In order to gather participants to assess SAD and other depression-like disorders/ symptoms on campus, snowball sampling is currently being used. Participants are asked to sign-up for a focus group that discusses SAD, physical activity, and nutrition on campus. Participants are also administered the Personal Inventory for Depression and SAD (PIDS) in order to provide a background on the sample’s depression/ SAD symptoms. **Results/Discussion:** The study is currently still in process. Upon the completion of the study, I will use these data in order to propose a health intervention to meet the needs of the population. Potential intervention methods may include improving nutrition or nutrition education, improving access to physical activity, and/or some combination.

**“Service Learning: A Student Perspective”**
Poster 2, 11:30 a.m.-12:30 p.m., Activities Room
Presenters: Brandon Kasberg (Pharmacy), Jordan G. Hughes (Pharmacy), Emily Howell (Pharmacy), Alexandra Latala (Pharmacy)
Research Advisor: Michelle R. Musser (Pharmacy Practice)

**Objective:** Service learning is essential to pharmacy education, aiming to develop professionalism, care skills, and knowledge application. With an emphasis on the co-curriculum in pharmacy education standards, it is essential to evaluate the student perspective of service learning including preparedness, experience quality and suggestions for improvement. **Methods:** Pharmacy students at a rural, private college of pharmacy are required to complete forty hours of service learning during their professional program. Students completed a survey regarding their service learning experience at the conclusion of their fifth year (of a 0-6 program). Quantitative and qualitative data were collected to determine efficiency and quality of service learning opportunities for students. **Results:** The majority of students strongly agreed that they were able to meet the objectives of service learning through their experience. Forty-five percent of students rated their service learning experience as “excellent.” Over 95% of students felt well prepared to participate in service learning events. Students, particularly those involved with pharmacy organizations, did not report difficulty fulfilling required hours, but limited availability was noted as a concern. Some assessment methods utilized, including reflection papers, were not considered highly effective by students. Patient interaction and applying classroom knowledge were seen as the most beneficial aspects to service learning. Student suggestions for improvement included better explanation of outreach opportunities, improved event availability, and more hands-on experiences. **Implications:** Service learning allows students to develop key skills needed for practice. Insight into student perspectives provided suggestions to further improve the experience.

**“Situation, Background, Assessment, and Recommendation during Nurse-to-nurse Shift Report”**
Poster 12, 12:45-1:45 p.m., Activities Room
Presenter: Mackenzie E. Horwath (Nursing)
Research Advisors: Nancy Schroeder (Nursing), Megan Lieb (Nursing)

Nursing shift report is a crucial to patient care; it is handing off care from one nurse to another and requires effective communication. Situation, background, assessment, and recommendation (SBAR) format is used in the healthcare setting to communicate information in a prioritized, concise, and efficient way. Important information can be omitted during nurse to nurse shift report when reporting from memory leading to poor patient outcomes. A pre-survey was distributed to nurses on a twenty-six bed medical-surgical unit to determine: 1) how they report off during nurse to nurse shift report, 2) how efficient nurse to nurse shift report is, and 3) whether SBAR format is used. Most nurses surveyed reported giving report from memory rather than using the SBAR format. Education on SBAR during nurse to nurse shift report and a SBAR form will be distributed to the nurses on the unit. A post survey will then be distributed to determine the impact of SBAR format on nurse to nurse shift report. The goal is to decrease the amount of information omitted during nurse to nurse shift report.

**“Speak for Yourself”**
Poster 1, 12-2 p.m., Wishing Well
Presenter: Kaitlin Rubottom (Public Health)
Research Advisor: Christine North (Communication and Media Studies)

Nonverbal communication is defined as the “unspoken dialogue of communication” by Burgoon, Guerrero, and Floyd. This type of communication makes a huge impact on the way we give understanding and meaning to interactions. When someone is not able to understand and make meaning out of these nonverbals cues, that’s when communication and interactions are not successful. For instance, an individual with autism is not able to understand the traditional social cues as well as another without it. For this study, there will be research conducted on an individual with high-functioning autism and how they create meaning and understanding with these nonverbals. This then leads into the research question, “What similarities and differences in nonverbal communication exist between the primary participant and his family members?” The tactics that will be used for this study consist of interviews and observations of the primary participant and his family members. Data and conclusions for this research will be discussed during the presentation.

**“Stethoscope Hygiene in the Emergency Department”**
Poster 7, 12:45-1:45 p.m., Activities Room
Presenter: Laura Houtz Burden (Nursing)
Research Advisors: Megan Lieb (Nursing), Nancy Schroeder (Nursing)

**Objective:** The purpose of this study was to evaluate the perceptions of Emergency Department (ED) nurses towards cleaning their stethoscopes and how clean stethoscopes affect
health-care related infections. Background: Research shows that stethoscopes are capable of transmitting bacteria between patients leading to an increase in hospital-acquired infections. Stethoscope hygiene is key to reducing the number of bacteria present. Subjects and Methods: A convenience sample was carried out in the month of March. The study included 16 nurses from the Emergency Department. A Likert questionnaire was distributed to nurses before the start of night shift. Results: 11/16 stated they had enough time to clean their stethoscope, 15/16 agreed that cleaning agents are always available and that it is important to clean their stethoscope, 2/16 agreed that they see others cleaning their stethoscopes often and 14/16 stated they know how to properly clean their stethoscope. 12/16 believed stethoscope hygiene education would help them clean their stethoscopes more often. Conclusion: Based on the nurses’ responses, it would be very useful to implement education on stethoscope hygiene in the yearly education classes for nurses with the aim of applying stethoscope disinfection in daily work.

“Stress that Is Temporally Separated from Learning Sex-Dependently Affects Long-term Memory in a Forged Confabulation Paradigm”
Poster 10, 11:30 a.m.-12:30 p.m., Activities Room
Presenters: Mackenzie Rene’ Riggenbach (Psychology – General), Jordan N. Weiser (Psychology – Behavioral Neuroscience), Leighton E. Wireman (Pharmacy), MacKenzie G. Kaschka (Molecular Biology), Kassidy E. Reneau (Psychology – Behavioral Neuroscience), Sara J. Helwig (Statistics)
Research Advisor: Phillip R. Zoladz (Psychology, Sociology, and Criminal Justice)

Stress exerts time-dependent effects on learning. When stress is administered immediately before learning, long-term memory is enhanced; when stress is temporally separated from learning, long-term memory is impaired. Thus, we predicted that stress administered 30 min before learning would impair the storage of a witnessed event and increase participants’ susceptibility to false memory formation. Eighty-six participants underwent a stress (socially evaluated pressor test) or control manipulation 30 min before viewing an 8-min excerpt from the Disney movie Looking for Miracles. The next day, participants were interviewed and asked questions about the video, some of which forced them to confabulate responses. Three days and three weeks later, respectively, participants completed a recognition test in the lab and a free recall test via email. Results revealed a robust misinformation effect, overall, as participants falsely recognized a significant amount of confabulated information as having occurred in the original video. Stress, overall, did not significantly influence this misinformation effect. However, stress impaired the recognition of actual events that occurred in the video in males, while enhancing such recognition in females. These findings indicate that stress temporally separated from learning selectively impairs memory in males, which is consistent with previous research.

“Synthesis of [O, O, N, O] Ligands for Application in Polymerization”
Poster 18, 12:45:1-45 p.m., Activities Room
Presenter: Kristina Myers (Biochemistry; Biology)
Research Advisor: Amelia Anderson-Wile (Chemistry and Biochemistry)
The synthesis of amine bis(phenolate) ligands with green chemistry applications was performed via the Mannich reaction. Amine groups were varied and included a variety of amino acid precursors. Synthesis conditions were optimized and ligands were characterized utilizing 1H NMR and 13C NMR. This included the determination of protonation state of the ligands via a 1H NMR experiment. Ligands were then complexed to metal centers and the complexes were characterized by 1H NMR and 13C NMR. Implications of this research are to synthesize catalysts for polymerization.

“The Breakfast Nook: A New Restaurant in a Columbus, Ohio, Suburb”
Poster 21, 10:15-11:15 a.m., Activities Room
Presenters: Devin Johnson (Marketing), Nolan Yarhmarkt (Marketing)
Research Advisor: Harry Wilson (Business Administration)

Many restaurants in Columbus, Ohio, serve breakfast. Many compete for customers and rely on unique menu items to bolster their business. The current research uses geospatial analysis to determine the worth of a new breakfast-only restaurant in a Columbus suburb. We examine the highly competitive industry and focus on particular population segments that prefer to eat breakfast away from home. This demographic provides us with our customer base and their prevalence in the area support our conclusion that this new restaurant will become profitable in a just a few years. We also propose a location for the restaurant based on spatial analysis of residents and traffic patterns.

“The Effect of Color and Image on Scent Perception of Lemon and Peppermint Odors”
Poster 16, 11:30 a.m.-12:30 p.m., Activities Room
Presenters: Kaitlyn Hurd (Psychology – Clinical and Counseling), Allison Dennis (Psychology – General), Joshua Mohr (Psychology – Clinical and Counseling)
Research Advisor: Kristie Payment (Psychology, Sociology, and Criminal Justice)
The purpose of this study was to examine the effects of image on the perceived odor intensity of two different smells among college students. A 2x3 mixed design was employed with type of image (white, congruent color, and congruent image) as the within-subjects factor and scent of essential oil (lemon or peppermint) as the between-subjects factor. 70 participants (22 male, 47 female, I preferred not to say) were shown one image at a time, and then were asked to rate the perceived odor intensity on an 11 point Likert scale. The actual odor paired with each image was equal. An increase in intensity ratings between the white control image, the congruent color, and congruent image was predicted. An overall higher intensity rating in the peppermint group was also hypothesized. Results indicated a significant main effect of type of image shown, but no significant impact of odor type. This implies an interaction between visual and olfactory senses.

“The Effect of Headlines on the Perception of Harm”
Poster 18, 11:30 a.m.-12:30 p.m., Activities Room
Presenters: Paige Goodwin (Psychology – Behavioral Neuroscience), Trystan Norman (Criminal Justice; Psychology – General)
Research Advisor: Ann Johnson (Psychology, Sociology, and Criminal Justice)

With the increasing usage of Juuls in young adults and adolescents, especially in high schools and on college campuses, the research on Juuls is growing. Studies have been done comparing how different advertisements and news headlines affect perceptions of harm of e-cigarettes, finding various results. Due to the novelty of Juuls and the inconclusive research, the current research examines the effects of news headlines and article excerpts on the perceptions of college students. In our study we showed participants either negative or neutral headlines/excerpts about Juuls. As a result of the popularity in college students and adolescents, we began looking into the research comparing the differences in perceptions of harm between the two groups and found little research on the topic. Due to these findings, we decided to then give the participants either a survey about the perception of harm of Juuls for adolescents or other college aged adults. Following the perception of harm survey, participants were also surveyed about previous Juul, e-cigarette, or traditional cigarette use. Participants were shown 4 headlines total, with each headline/excerpt being shown for 90 seconds. Research is currently still being conducted.

“The Evolved Parallel Spiking Neural Network”

Paper 5, 12-2 p.m., Wishing Well
Presenter: Derek Michael Smith (Computer Engineering)
Research Advisor: Heath LeBlanc (Electrical and Computer Engineering and Computer Science)

Many machine learning approaches rely on artificial neural networks and their training algorithms to solve given problems. However, the fixed-structure, static nature of these models is contrary to the ever-adaptive, dynamic nature of biological neural networks. Spiking Neural Networks (SNNs) partially address this problem, but at a cost of computational complexity and trainability. Proposed is a model referred to as Evolved Parallel Spiking Neural Network (EP-SNN), which enhances the dynamic and concurrent nature of SNNs in a model closely-inspired by biological neurons and synapses. EP-SNNs are optimized by a direct-encoding Genetic Algorithm (GA), a class of evolutionary computation. Parameters are flat arrays of neurons and synapses. To allow topological evolution, synapse routes and weights are parameterized. These values change as part of normal optimization alongside activation thresholds of discrete-time, Integrate-and-Fire Neurons with parameterized activation thresholds. Due to the natural concurrency of this architecture, a hybrid instruction and data-level parallelism model is implemented in EP-SNNs and the GA, allowing for GPU-accelerated evaluation of models. A number of sample machine learning problems were used to test the capabilities of the EP-SNNs. Resulting models are smaller and more efficient than their fixed-structure, 2nd-generation counterparts, and solve given problems with comparable accuracy.

“The Impact of Applicant Gender and Shirt Color of Applicant on Hireability”

Poster 15, 11:30 a.m.-12:30 p.m., Activities Room
Presenters: Kaitlyn Ashley Krill (Criminal Justice; Psychology - General), Whitney Jones-Downs (Psychology - Clinical and Counseling; Sociology - General), Emma Virden (Psychology - General), Elisabeth Moeller (Psychology - General)

Several studies over the past 15 years have shown that men are often perceived as more hireable than females.1,2,3 In addition to gender, research on hireability has focused on clothing color and has found it to affect hireability.4,5 A 2x3 between-subjects design was employed to examine whether the shirt color of a job applicant (red, white, or black) interacted with the gender of the job applicant (male or female) to impact perceived hireability. 105 college students (39 male and 66 female) from a small midwestern university participated in the study. Participants all read the same résumé paragraph and then looked at a picture of either a male or a female job applicant wearing either a red, white or black shirt. Participants then rated the job applicant on an 18-point hireability scale.6 Findings suggest that the color of the shirt worn by the job applicant does not affect their perceived hireability F(2, 99)=1.183, p=0.311, η²=0.023. However, female job applicants were perceived as more hireable than male job applicants F(1, 99)=9.112, p=0.003, η²=0.084. These findings contradict previous research that suggests that the color worn by a job applicant does affect perceived hireability. Additionally, contradictory to previous research, male job applicants were not perceived as more hireable than the female applicants. Overall, the findings of this study indicate a potential shift in perceptions of gender stereotypes in the workforce.

“The Impact of Emotionality of Positive or Negative Music on the Recall of Positive or Negative Emotional Events”

Poster 17, 11:30 a.m.-12:30 p.m., Activities Room
Presenters: Kassidy E. Reneau (Psychology - Behavioral Neuroscience), Joslyn Lieb (History), Elizabeth Wenning (Criminal Justice; Psychology - Clinical and Counseling)
Research Advisor: Kristie Payment (Psychology, Sociology, and Criminal Justice)

Research has found that music impacts memory and emotion. The current study examined effects of positive or negative music on recall of a positive or negative witnessed event. It was hypothesized that negative music would lead to lower recall scores about the event than positive music, and that emotionality of the witnessed event would not impact recall scores. Finally, a mood congruency effect was hypothesized, such that when the emotionality of music and video were the same, participants would recall more. Participants consisted of 74 college students (19 male and 55 female) from a private, midwestern university. Participants were randomly assigned to one of four conditions of a 2x2 between-subjects design with music type (positive or negative) and video type (positive or negative) as between-subject factors. There was no significant difference in recall performance between positive and negative music conditions (p=0.661) or positive and negative witnessed event (p=0.578). There was no interaction between the emotion of music and the emotion of the event (p=.950). Thus, the mood congruency effect was not supported. These findings suggest that emotionality of music does not have an impact on recall of a witnessed event, even when the emotionality of music and event are congruent.

“The Impact of Sleep Deprivation on Reaction Time in College Athletes”

Poster 1, 10:15-11:15 a.m., Activities Room
Presenters: Montana Moore (Athletic Training), Daniel Rohan (Athletic Training)
Research Advisor: Kurt Wilson (Human Performance and Sport Sciences)

Introduction: A quick reaction time is important when avoiding injury in athletics. Reaction time is negatively affected by lack of sleep, since a history of sleep deprivation correlates with a slower reaction time. A common and effective way to measure reaction time is the Ruler Drop Test. The purpose of this study was to determine the correlation between the amount of sleep a collegiate athlete receives and their reaction time using the Ruler Drop Test. Methods: This study included 18 collegiate athletes who wore a FitBit or other sleep monitoring device during sleep. This sleep data was used in conjunction with a sleep survey. After completing the sleep survey, participants were read standardized instructions then performed the Ruler Drop Test. They completed 3 practice drops prior to performing their measured drop, which was recorded to the nearest millimeter aligned with the medial border of the thumb. This process was repeated for two separate trials. Results: 6 athletes had longer reaction distances during the trial where they received less sleep. In contrast, 5 athletes had longer reaction distances during the trial where they received more sleep. The remaining 7 athletes had the same amount of sleep before both trials, so we cannot conclude that sleep was the cause of the differences in their reaction times. Conclusion: Based on our results, we cannot conclude that amount of sleep has a direct effect on reaction time.

“The Key Ingredient in Order Finding: Quantum Fourier Transform through Examples”
Poster 23, 11:30 a.m.-12:30 p.m., Activities Room
Presenter: Bradley Lockhart (Physics - Physics)
Research Advisor: Mellita Caragiul (Physics and Astronomy)

This work is the outcome of our consulting several quantum computing books and articles in an attempt to find works that achieve a balance between technical detail and expository quality. It is part of our effort of putting together an introduction to particular core ideas of quantum computing theory that is also accessible to undergraduates. The main theme considered here is the quantum Fourier transform as an essential ingredient in obtaining the period of a sequence of natural numbers (otherwise known as order finding). The issue arises in Shor’s algorithm of factoring large numbers, a task that it is believed that quantum computers would perform with a much higher efficiency than classical ones.

“The Link between Eating Disorders and Bullying”
Paper 4, 12-2 p.m., Wishing Well
Presenter: Joy Yancy (Sociology - General)
Research Advisor: Robert Carrothers (Psychology, Sociology, and Criminal Justice)

Mental health is an important factor in today’s society. According to the National Alliance on Mental Illness (NAMI), millions of Americans are affected by mental health conditions every year (NAMI 2018). It affects how we think, feel, and act. It also helps determine how we handle stress, make decisions, and relate to others. There are factors that can have a serious impact on mental health. Eating disorders plague people of all ages, races, and genders. There are many variations of eating disorders, the most common being anorexia nervosa, bulimia, binge eating disorder, and overeating disorder. As time goes on, more and more children and teenagers are being diagnosed with a mental illness. There are a wide range of illnesses and each comes with their own stigma. However, bullying directly contributes to eating disorders. Previous studies have reported significant associations between bullying (by friends or family) and restrictive eating, or bulimic behaviors (“Eating Disorder Statistics,” 2018). Durkheim argued that deviation had the ability to maintain boundaries for society and to also spark social change. Durkheim believed that deviance from social norms are necessary positives in society which is the whole reason as to why they exist. In all, bullying is a risk factor for eating disorders.

“The Medicalization of FGM: Difficulty in Abolishing the Practice”
Poster 3, 12:45-1:45 p.m., Activities Room
Presenter: Mahawa Koroma (Political Science)
Research Advisors: Kofi Nsia-Pepra (History, Political Science, and Geography), Anne Whitesell (History, Political Science, and Geography)

“The healer used a knife to remove a tiny piece of skin from the hood that covers the clitoris, which she said looked like a ‘garlic skin’ then stuck the knife into a lemon” (South China Morning Post, par. 3). Since the beginning of time women have suffered numerous forms of violations, especially in the hands of their male counterparts. Female genital mutilation is a traditionally rooted process involving the partial or complete removal or alteration of healthy female genitalia for non-medical reasons” (Mukherjee, 2). The pricking or cutting of the female genitalia (clitoris) has been the reality for millions of girls around the world. According to data collected by the world health organization, more than 200 million girls in the world have undergone this heinous process. Legal documents such as the Universal Declaration of Human Rights (UDHR) and The Convention on the Rights of the Child, The Convention on the Elimination of All Forms of Discrimination against Women (CEDAW) and the Prohibition of FGM Act of 1998 condemns the tradition of female genital mutilation. I used a case study research to examine the medicalization of female genital mutilation and the difficulty to abolish the act in Egypt. I also studied Indonesia as a secondary state to further examine the issue of female genital medicalization. My research confirms that medicalizing female genital mutilation leads to the difficulty in abolishing the act, even in cases where there are rules against female genital mutilation. Medicalization is used as a justification for the continued practice of FGM.

“The Ohio Northern Tree Project: A Comprehensive Campus Tree Survey with Community Education and Outreach”
Poster 10, 10:15-11:15 a.m., Activities Room
Presenter: Zachary A. Bragg (Environmental and Field Biology)
Research Advisors: Robert G. Verb (Biological and Allied Health Sciences), Harry Wilson (Business Administration)

In the spring of 2011, the nonprofit Arbor Day Foundation gave Ohio Northern University the designation of a “Tree Campus USA” school. This honor placed ONU among the most elite environmentally conscious schools in the United States. I had a vision to bring the information from this initiative back to ONU and modernize its availability. I wanted to the students of ONU and members of the Ada community to enjoy the beauty of
ONU’s trees, all the while, learning simple botanical knowledge. Over the spring semester I began cataloguing the trees present on ONU’s campus and compiled this data into an online website. I designed an interactive website to present basic identification and natural history information about each tree in an easy to understand format. I then tagged one tree of each unique species on campus to serve as a visual example of the tree profiles on the website. Using these example trees and their locations, I created and mapped a route that passed each and every tree, so visitors to campus could walk this path and not only enjoy our campus but also learn about our amazing tree diversity.

“The Use of Humor to Reduce Stress among Nurses and Increase Patient Safety”
Poster 5, 12:45-1:45 p.m., Activities Room
Presenter: Alexander M. Cline (Nursing)
Research Advisors: Leslie Bostick (Nursing), Nancy Schroeder (Nursing)

Nursing is a discipline that is consistently burdened by stress. Nurses report some of the highest stress levels of any profession, and that stress takes a toll on their physical, mental, and spiritual health. Nurses deal with life and death every day. Therefore, learning to manage their stress is essential. Research has shown that humor and laughter are effective at alleviating stress, and dealing with the ever-present emotional trauma that healthcare workers face. As such, this study aims to identify the stress levels of nurses on a medical intensive care unit, determine if that stress level affects patient outcomes, and implement humorous nursing anecdotes and the smartphone application “Happify,” which allows the nurses to self-determine their current happiness levels and follow simple daily exercises to improve overall happiness and mood. A pre-and-post-survey will be completed by a convenience sample of nurses to evaluate the efficacy of these interventions. Results will be forthcoming.

“The Viability of a New Pharmacy in Findlay, Ohio”
Poster 24, 10:15-11:15 a.m., Activities Room
Presenter: Takashi Yuzawa (Marketing)
Research Advisor: Harry Wilson (Business Administration)

Modern pharmacies provide an abundance of health care products, as well as other items such as snacks, beverages, beauty aids, and prescription medications. CVS, Rite Aid, and Walgreens are well-known pharmacies in Northwest Ohio. Further, many large shopping centers such as Walmart, Winn-Dixie and Meijer commonly have pharmacies. The current research examines the viability of a new pharmacy in Findlay, Ohio, where nearly 41,000 people live. It assesses local demographics and customer needs and concludes that the community would not support another pharmacy.

“The Viability of a Record Store in Ada, Ohio”
Poster 23, 10:15-11:15 a.m., Activities Room
Presenter: Travis Yammine (Marketing)
Research Advisor: Harry Wilson (Business Administration)

Record stores have enjoyed a resurgence in popularity in recent years in the United States. In Northwest Ohio, most medium-to-large cities and a few small towns currently have record stores that opened within the last five years. Despite optimism, establishing and maintaining a lucrative record store remains challenging. The current research examines the viability of an existing record store in Ada, Ohio. Commonly used geospatial analysis shows that the business is well situated to attract customers, but that their business model would benefit from small changes to their marketing campaign.

“Theoretical Background for Experiments Testing Bell’s Inequalities”
Poster 22, 11:30 a.m.-12:30 p.m., Activities Room
Presenter: Bryan Peck (Physics – Physics)
Research Advisor: Mellita Caragiu (Physics and Astronomy)

Five decades of experimental work in the foundations of quantum mechanics have been trying to settle the issue of the Copenhagen interpretation versus the local, hidden-variable approach. In any experiment, two main theoretical ingredients are required: the predictions of the current quantum mechanical theory of the experiment’s outcomes, and the predictions of a local hidden-variable theory of the same experimental outcomes. We follow a few of the inequalities which arose from Bell’s 1964 famous theorem, as well as the QM predictions of experiments performed with either spin-1/2 particles, or spin-1 photons.

“Toward Rapid, Facile Detection of Trace Narcotics Using Laser-ablated Metal Nanoparticles for Surface-enhanced Raman Spectroscopy”
Poster 21, 12:45-1:45 p.m., Activities Room
Presenters: Samuel R. Powell (Chemistry), Timothy Dunn (Chemistry)
Research Advisor: Jeffrey A. Gray (Chemistry and Biochemistry)

Current methods for the identification of samples containing possible narcotics, such as cocaine, heroin, and methamphetamine, are costly and time consuming, requiring the sample to be analyzed by a certified lab, usually by chromatography and mass spectrometry. Key characteristics of methods for determining narcotics include specificity, low limits of detection, and robustness against interferences. We are developing a method for determination that employs Raman spectroscopy. A few Raman signals can identify a specific narcotic. This method is robust against interferences because of the well-known characteristic Raman bands. In order to obtain sufficient signal from trace samples of narcotics, we are utilizing metal nanoparticles to achieve surface enhancement. The analyte molecules are attracted to the metal particles and interact with the plasmon resonance of the nanoparticles. We have a reliable method for synthesizing the nanoparticles with laser ablation techniques and have used test molecules to prove our method and found an enhancement factor on the order of $10^3$. We have been exploring the use of organic molecules as linkers to aggregate the nanoparticles and provide greater enhancement. We hope to be able to identify various narcotics in a matter of minutes with sub-micromolar samples.

“Unmagnetized Rotating Yukawa Ring in a Dusty Plasma”
Poster 21, 11:30 a.m.-12:30 p.m., Activities Room
Presenter: Matt J. Sibila (Physics – Physics)
Research Advisor: William Theisen (Physics and Astronomy)
A strongly coupled unmagnetized 1-D dust ring interacting through a Yukawa potential is created experimentally. Radial confinement is provided by a 70 mm (O.D.) groove with a center pedestal. The dust particles rotate within the ring-shaped potential well even though drag forces are present and there is no readily identifiable driving force. The rotation rate of the ring is measured and possible driving forces for rotation are examined.

“‘What Do You Want from Me?’–Said the Church: A Guide to Better Church Communication”

Paper 5, 12-1:45 p.m., Deans’ Heritage Room
Presenter: Michaela Long (Communication Studies; Public Relations)
Research Advisor: Mark D. Cruea (Communication and Media Studies)

Churches often have a small marketing budget and limited staff to figure out how to communicate to their church members and beyond. Society is flooded with messaging and it can be difficult to get your message to stick with your intended audience. This study helps churches understand how their audience prefers to be communicated to, what topics they are interested in hearing about, and what factors may change their communication style. Through an online survey sent to ONU students and areas church members, data will be collected and analyzed to show what channels people are using, what channels they prefer to follow churches/organizations on, and what topics they are interested in hearing about from a church. These results will show what churches can be focusing their budget and time on in order to better communicate in the future. This study is important because not only do churches have a hard time understanding the best way to communicate, but there is also a new generation coming into the adult portion of the church and this research will help them understand their communication habits.

“Your Region Is Here”

Paper 2, 10-11:45 a.m., Wishing Well
Presenter: Bryan Z. Kelly (Graphic Design)

Research Advisor: Henry L. Sheets (Art and Design)

One of the most important responsibilities I have as a professional designer is to make sure my work has a positive impact on the audience and the community. Something I noticed when I started studying graphic design was corporate design. It really is the focus of most designers with design firms being placed snugly in urbanized America. Large corporations and cities have the resources for extensive design projects and branding, but the community that often gets overlooked is small-town America. Many of us come from small communities and there is a lot that makes them important, unique, and valuable. There are a lot of large-scale projects for social, economic, and political change that are of great value, but I believe it is always important as a designer to take the time to focus on the small issues that I can directly change or impact around my local community. I was raised in Covington, Ohio, with a population of around 2,500 and graduated with about sixty of my classmates. One of the important parts of living in a small town was that you really got to know everyone and everything at least a little bit. With the This is Your Region project that was exactly my goal, to create an effective campaign that puts a spotlight on the community’s local area and really brings it together as a unified whole. During my summer internship I found out about the non-profit, The Greater Lima Region. This is a 501(c)(3) tax-exempt private non-profit corporation with a strategic focus on developing and revitalizing the greater Lima, Ohio region. Some of their goals were described as follows: “Overseeing projects and programs designed to strengthen and improve the Region […] expanding and retaining business, industrial, educational, cultural, civic, community and other enterprises in the Region.” Using this non-profit as a platform, I devised a way to create a cultural spotlight that also provides exposure for local businesses and community events. Two of the most important qualities for the project are interactivity and discovery. The campaign pushes you to discover areas that you may have never really thought about or been to and learn more about them in the process. It puts a spotlight on the local community and brings it together as a unified whole.
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Please join us next spring for the 2020 Ohio Northern University Student Research Colloquium!

-Mary Drzycimski-Finn, ONU Colloquium Organizer