



Welcome to  
Tower Day 2021!



# April 23

Join us for a day of academic dialogue and celebration at Columbus State University. Tower Day is an annual celebration of CSU undergraduate research and creative endeavors. CSU students from different disciplines will present their research and creative endeavors in the form of fifteen minute oral presentations, poster presentations, and performances.

This program is designed as an initiative to give CSU students an opportunity to share their research outside the classroom. Our virtual event has keynote presentations by a CSU alumnus and a current faculty member, professional development workshops, poster presentations, and oral presentations.

# Program

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Scholastic Honors Convocation

# Poster Presentations

Summra Akalework & Kathleen Rhinebolt

Mentors: Guihong Fan & Kristin Seamon Lilly

Comp Sci - CyberSecurity

[\*Direct & Indirect Factors in the Rise of COVID-19\*](#) [[Abstract](#)]

Jenna Blanchard, James Robbins, Megan Lozier & Hayley Walker

Mentor: Emily Taylor

Nursing

[\*NICU Medication Errors\*](#) [[Abstract](#)]

Sophia G. Brown

Mentor: Masako R. Okura

History

[\*Analyzing How Female Politicians are Represented in Magazine Profiles\*](#)  
[[Abstract](#)]

Sophia G. Brown

Mentors: Sarah Bowman & Martin Ruehl

History

[\*Fascism in America: A Reassessment\*](#) [[Abstract](#)]

Stephanie D. Clarke

Mentor: Diana K. Riser

Psychology

[\*Electrocortical Correlates of Emotion Processing in Resilient and Non-Resilient Individuals\*](#) [[Abstract](#)]

Madison M. Coleman, Cassi Caughey, William Whisnant & Ladonna Jenkins

Mentor: Stacey S. Blersch

Earth and Space Science

[\*Weracoba Creek Watershed Plan\*](#) [[Abstract](#)]

Madison M. Coleman

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[\*The Chattahoochee River Conservancy's Research on the Escaped Trash Assessment Protocol\*](#) [[Abstract](#)]

Brandon K. Corn

Mentor: Alfredo Perez

Comp Sci - Web Development

[\*An Evaluation of the power Consumption of Co-Authentication as a Continuous User Authentication Method in Mobile Systems\*](#) [[Abstract](#)]

Zachary Culpepper, Summer Wilson, Hannah Jackson, Alexis Tucker & Savannah Wassmer

Mentor: Emily Taylor

Nursing

[\*Preventing Post-Traumatic Stress Disorder in Parents Experiencing Trauma Related To Newborn Complications and Prolonged NICU Stays\*](#) [[Abstract](#)]

Maya E. Davis, Dr. Stacey Blersch, Dr. Andrea Frazier & Dr. Dawn Truong

Mentors: Stacey Blersch, Andrea Frazier & Dawn Truong

Health Science

[\*Food Desert or Food Oasis: A Ring of Unhealthy Food Chains Suffocating College Students\*](#) [[Abstract](#)]

Carlie H. Dollar, Sierra R. Barlow & Samuel W.L. Dixon

Mentor: Clifton B. Ruehl

Biology

[\*Shared and Unique Shell Shape between Flow Regimes Among Populations of Freshwater Snails\*](#) [[Abstract](#)]

Madelyn E. Eysel, Rachel Howard, Kyle Nauman & James Jones

Mentor: Stacey S. Blersch

Earth and Space Science

[\*The Restoration of Weracoba Creek\*](#) [[Abstract](#)]

Domenica Fertal & Jihyeon Park

Mentor: Anil C. Banerjee

Chemistry

[\*Effect of Calcination Temperature on Methane Combustion by PdO/Alumina Catalysts\*](#) [[Abstract](#)]

Sabrina N. Fisher & Mackenzie Coffee

Mentor: Clinton I. Barineau

Earth and Space Science

[\*Extracting Baddeleyite and Zircon from the Marble Hill Hornblende Schist\*](#) [[Abstract](#)]

Kayla M. Fortune & Isabella Nunez

Mentor: Guihong Fan

Comp Sci - CyberSecurity

[\*Identifying Trends In Daily COVID-19 Cases and COVID-19 Vaccines Being Administered Through Data Analysis\*](#) [[Abstract](#)]

Shakeria A. Gathers

Mentor: Patricia Anafi

Health Science

[\*The Effect of Social Media on Health\*](#) [[Abstract](#)]

Jali A. Hoehn

Mentor: Christopher J. McCollough

Music Education

[\*A Comparison Between Propagandistic Music of the Nazis and the Neo-Nazis\*](#) [[Abstract](#)]

Kenya S. Isllcer

Mentor: Ronald C. Linton

Mathematics

[\*Using AI to Improve Student Learning in Abstract Algebra\*](#) [[Abstract](#)]

Haley B. Johnson

Mentor: Kevin S. Burgess

Biology

[\*Novelties in Ecuadorian Styracaceae: Disentangling the Identity of a New Species or New Genus\*](#) [[Abstract](#)]

Michael J. Lambert & Lindsay Wright

Mentor: Patricia Anafi

Health Science

[\*Schedule Keeping in Alzheimer's and Dementia Therapy in the Elderly\*](#) [[Abstract](#)]

Maria Paula Loria Valerin

Mentor: Reba Wissner

Music Performance

[\*Handel's Harp Concerto: History and Performance and History\*](#) [[Abstract](#)]

Ashley E. Lowe, Sarah Barnes, Susan Hodge, Nicole King & Caitlynn Weeks

Mentor: Emily Taylor

Nursing

[\*The Use of Basic and Interactive Dressing in Reducing Surgical Site Infections\*](#) [[Abstract](#)]

Jasmin Mercedes, Beonica Campbell, Deangela Collins, Arthur Evans, Michelle Johnson & Brittany Taylor

Mentor: Emily Taylor

Nursing

[\*Best Ways to Reduce Hospital Acquired C. diff Infection in Among Patients in the Clinical Setting\*](#) [[Abstract](#)]

Miguel A. Montiel Cubas & Suk Lee

Mentor: Suk J. Lee

Comp Sci - Software Systems

[\*The Power of Internet of Things\*](#) [[Abstract](#)]

Jiro J. Newton & Julie Fernandes

Mentor: Emily Taylor

Nursing

[\*Best Nursing Interventions for Prevention of Ventilator-Associated Pneumonia\*](#) [[Abstract](#)]

Lessie Ousley, Michelle McDonald, Nicholas Doherty, Kanequa Copelin & Josephine Draper

Mentor: Emily Taylor

Nursing

[\*Different Methods of Managing or Controlling Postpartum Hemorrhage\*](#) [[Abstract](#)]

Grace A. Pippas

Mentor: Patrick E. Jackson

Communication

[\*Artificial Intelligence: An Illuminated Manuscript Creation Story\*](#) [[Abstract](#)]

Kathleen E. Rhinebolt

Mentor: Brandt Smith

Psychology

[\*Jury Decision Making with Female Veteran on Trial\*](#) [[Abstract](#)]

Isabelle Rodriguez, Dominic Fico, Zijie Lin, Julie Wilson, Adaimoabasi Udo, Monique Echevers, Shanina S. Johnson, Dr. Monica Frazier, Dr. Lauren King & Dr. Kerri L. Shelton

Mentor: Kerri S. Taylor

Chemistry

[\*Synthesis, characterization, and biological activity of asymmetric N,N'-bis-substituted triazolium salts as potential antitumor and antimicrobial agents\*](#) [[Abstract](#)]



Destin Smith, Jessica Buzzell, Olga Hernandez, David Parks, Jessenia Rodriguez & Haley Worrell

Mentor: Emily Taylor

Nursing

[\*Patient Safety: Implementation of the Surgical Time-Out\*](#) [[Abstract](#)]

Rasheed S. Tillman & Antonio Hardy

Mentor: Diana K. Riser

Psychology

[\*The Impact of Social Support and Stress on Life Satisfaction\*](#) [[Abstract](#)]

Sabrina P. Warren, Abigail Blankenship, Jessica Dixon, Kaleigh Bishop & Kendall Fritzky

Mentor: Emily Taylor

Nursing

[\*Breastfeeding and Nipple Confusion\*](#) [[Abstract](#)]

Marianne D. Weaver

Mentor: Emily Taylor

Nursing

[\*Postpartum Depression: Exercise vs. Pharmacological Interventions\*](#) [[Abstract](#)]

Lydia K. Whetzel, Harold Stansil, Tynasia Young, Shondra Jones & Tigist Gedrago

Mentor: Emily Taylor

Nursing

[\*Maternal Hypertension in African American Women\*](#) [[Abstract](#)]

# Professional Development Sessions

## Session 1

10:00am-10:30am

- Taking Control of Your Career Path, hosted by Jovan Johnson and the Center for Career Design
- Hack Learning with Sketch Notes, hosted by Hillary Fleenor and the Academic Center for Tutoring
- Forging Forward: Sparking Innovation through Servant Leadership, hosted by Laura Pate and The William B. Turner Center for Servant Leadership
- Why Should I Consider Graduate Studies at CSU?, hosted by Margie H. Yates, Interim Associate Provost for Graduate Education and The Graduate School

## Session 2

11:00am-11:30am

- Taking Control of Your Career Path, hosted by Jovan Johnson and the Center for Career Design
- Hack Learning with Sketch Notes, hosted by Hillary Fleenor and the Academic Center for Tutoring
- Forging Forward: Sparking Innovation through Servant Leadership, hosted by Laura Pate and The William B. Turner Center for Servant Leadership
- Why Should I Consider Graduate Studies at CSU?, hosted by Margie H. Yates, Interim Associate Provost for Graduate Education and The Graduate School

# Plenary Session

12:00pm-12:30pm

Rachel Pearson, Alumnus Keynote

*Uncertainty: The Driver of Change*

12:30pm-1:00pm

Dr. Sharon Renner, Faculty Keynote

*The COVID-19 Pandemic: Factors that Influence  
Patient Outcomes*

# Concurrent Oral Sessions

## **Breakout Room A**

*Moderator: Madalyn Duke*

1:30pm

Ashlyn N. Dewberry

Mentor: Daewoo Lee

*A Tale of Two Pandemics: A Comparative Analysis of U.S. Government Responses to the 1918 Influenza and COVID-19* [[Abstract](#)]

1:50pm

Chase A. Funk

Mentor: Ryan Lynch

*First Gulf War Propaganda: The Power of Television, Narrative, and Charisma* [[Abstract](#)]

2:10pm

Patrick J. MacDonald

Bryan Banks

*An Examination of the Propaganda of Donald Trump and Napoleon Bonaparte* [[Abstract](#)]

## **Breakout Room B**

*Moderator: Rasheed Mynatt*

1:30pm

Jonathan Y. Davidson, Jr.

Mentor: Eric Spears

*Leistung und Luxus, A study of the German Automotive Market* [[Abstract](#)]

1:50pm

Marta Lopez

Mentor: Eric K. Spears

*DACA* [[Abstract](#)]

2:10pm

Abigail L. Lloyd

Mentor: Eric K. Spears

*An Analysis of Street Art in Berlin, Germany, and Florence, Italy* [[Abstract](#)]

### **Breakout Room C**

*Moderator: Kayleen Linge*

1:30pm

Alejandro Huerta, Spencer Payne, Eloghosa Obasuyi & Kayla Fortune

Mentor: Yesem K. Peker

*Software Reverse Engineering Malicious Software to Enable Cyber Defense*  
[[Abstract](#)]

1:50pm

Michael J. Lambert & Bobbi Bass

Mentor: Sharon Renner

*Suicide Statistics* [[Abstract](#)]

2:10pm

Davis, Mary E

Mentors: Michael G. Newbrey & Jennifer Newbrey

*Factors that Affect Dental Extractions in the Small Animal Veterinary Practice*  
[[Abstract](#)]

Henry S. Leavitt [[Asynchronous Performance](#)]

Mentor: Stephanie Patterson

*Bassoon Ensemble* [[Abstract](#)]

## **Breakout Room D**

*Moderator: Ebony Robinson*

1:30pm

Jennifer K. Musgrove

Mentor: Patrick E. Jackson

*AI and Its Development In Fiction* [[Abstract](#)]

1:50pm

Jordan M. Slonaker, Trevon Harris & Nicholas Smith

Mentor: Shamim S. Khan

*Artificial Intelligence Application In Ranking Projections* [[Abstract](#)]

2:10pm

Jali A. Hoehn

Mentor: Reba Wissner

*Baroque Period Orphanages and Women's Music Education Accessibility*  
[[Abstract](#)]

## **Breakout Room A**

*Moderator: Rasheed Mynatt*

2:30pm

Kayla S. Ambler & LaQuaele Jackson

Mentor: Aaron Gierhart

*Exploring Culturally Relevant Topics with Science: What is the best product for a braid out?* [[Abstract](#)]

2:50pm

Kyla M. Sumter & Amanda Boyer

Mentor: Rebecca M. Toland

*Mask or No Mask* [[Abstract](#)]

3:10pm

Tanya Miller, Dr. Brian Tyo & Dr. Kate Early

Mentors: Brian M. Tyo & Kate Early

*Effects of Blood-flow Restriction Training: An Analysis of Baseline Group Differences* [[Abstract](#)]

### **Breakout Room B**

*Moderator: Cassi Caughey*

2:30pm

Caroline G. Behringer

Mentor: Stephanie P. da Silva

*Increasing Representation in Studies* [[Abstract](#)]

2:50pm

Charles Boggs

Mentor: Stephanie P. da Silva

*Difficulties in Maintaining Exercise and Solutions* [[Abstract](#)]

3:10pm

Morgan E. Wilson

Mentor: Aisha Adams

*Replicating a Study that Tests Shooting Bias* [[Abstract](#)]

### **Breakout Room C**

*Moderator: Ebony Robinson*

2:30pm

Korie E. MacDougall

Mentor: Masako R. Okura

*How Female Characters are Portrayed in Children's Television: An Analysis of Media's Role in Early Age Gender Socialization* [[Abstract](#)]

2:50pm

Jacob A. Woessner

Mentor: Daniel W. Holley

*A Novel Device for Conducting Recrystallization* [[Abstract](#)]

3:10pm

Shyrisse L. Ramos

Mentor: Kerri S. Taylor

*Chemical Investigations of Pasaquan and Interdisciplinary Paint Restoration*  
[[Abstract](#)]

### **Breakout Room D**

*Moderator: Jessica Odum*

2:30pm

Michelle D. Tucker

Mentor: Troy A. Keller

*Assessing toxicity in urban and rural streams in the Chattahoochee Valley (GA) using a lettuce seed germination bioassay (Lactuca sativa L.)* [[Abstract](#)]

2:50pm

Madelyn E. Eysel

Mentor: Troy A. Keller

*A Semester as a Drinking and Wastewater Lab Intern at Columbus Water Works* [[Abstract](#)]

3:10pm

Alejandro Huerta, James Robertson & Sahana Deb

Mentor: Yesem K. Peker

*Adding Integrity to Homomorphic Encryption Schemes* [[Abstract](#)]



# Abstract Index

## Poster Presentations

Summra Akalework & Kathleen Rhinebolt

### *Direct & Indirect Factors in the Rise of COVID-19*

The ongoing pandemic has affected many communities across the US and worldwide. We wanted to see what factors affected the spread of COVID-19 throughout the United States. Many news outlets have described the information differently and were trying to see the actual facts. In the beginning, the hotspot was in New York and now it has went West to California. We are currently gathering data, that is available, and trying to see factors, direct or indirect, that contributed to the increasing spread of COVID-19 cases.

Jenna Blanchard, James Robbins, Megan Lozier & Hayley Walker

### *NICU Medication Errors*

PICO Question: In NICU patients, what are the best practices for preventing medication errors? Definition of Problem: Neonates are a vulnerable population and are more likely to have adverse effects from medication errors. The current practice consists of the seven rights of medications, which are right drug, right time, right route, right dose, right patient, right to refuse and right documentation. The use of 2 way verification is another widely used practice; this is when 2 nurses are required to check the medication before administration.

Methods: We searched Proquest and CINAHL for research articles that discussed NICU medication errors. We used the words “NICU”, “fatalities”, “medication errors”, “best practice” and “prevention”.. We had three Level II good quality articles, one level III good quality article, and one level III high quality article.

Results: These studies used direct observation, self-reporting, and automated algorithms to calculate the number of medication errors. Many of the studies found distractions during the administration process and underdosing were extremely common, even with the current practices being used. However, because of the types of errors most did not produce fatal outcomes for the infants.

Conclusions/Recommendations: Many of the studies that used CPOE systems (computerized physician order entry) to try to minimize errors found that it was able to lower overall medication errors when used properly. A big issue is the lack of structure around what constitutes an “error”. The use of standard concentrations and more pump programming education could greatly reduce the amount of errors.

Sophia G. Brown

*Analyzing How Female Politicians are Represented in Magazine Profiles*

The representation of female politicians in media demonstrates recurring themes such as a disproportionate amount of gender-based scrutiny and a focus on female politicians’ competency or perceived lack thereof.

Additionally, coverage of women politicians tends to be personalized and intrusive into their private lives. It has been argued that such coverage derails their narrative away from their policies and instead focuses on their gender. Through an analysis of 30 magazine profiles of female politicians, my paper supports the existing scholarship on the subject while additionally highlighting the pervasiveness of personally intrusive interviews and how discussions of identity derail the media coverage of female politicians away from their policies.

Sophia G. Brown

*Fascism in America: A Reassessment*

Scholars of fascism do not hold a consensus on the definition of fascism. This lack of unanimity has led scholars to be hesitant to classify fledgling fascisms in America as such, instead, fascism is relegated as an interwar European phenomena. There were fascist tendencies and groups in the US during the interwar period, however, they have yet to be meaningfully assessed due to their failure to meet definitional standards of researchers.

Stephanie D. Clarke

*Electrocortical Correlates of Emotion Processing in Resilient and Non-Resilient Individuals*

Childhood trauma has been associated with a slew of mental and physical health problems in adulthood. Fortunately, certain resilient characteristics, such as constraint (i.e., impulse control, avoidance of unconventional behavior and risk) and reappraisal (i.e., the practice of reevaluating one's circumstances in a more positive light) have been shown to protect against these health ramifications. In the present study, we investigated the interaction between childhood trauma, resilience, and brain activity in response to evocative images. In part one of the experiment, participants responded to psychological surveys used to measure childhood trauma exposure and resilient characteristics. In part two of the experiment, participants passively viewed unpleasant, pleasant, and neutral images on a computer screen while their brain activity was recorded via electroencephalography (EEG) technology. In a hierarchical linear regression analysis, we found a significant interaction between childhood trauma and constraint in the unpleasant image condition only, suggesting that constraint weakens the relation between childhood trauma and brain activity in response to unpleasant images. We also found that childhood trauma and reappraisal independently predict brain activity in response to unpleasant images. This suggests that both a history of childhood trauma and resilient characteristics influence neural responses to unpleasant stimuli.

Madison M. Coleman, Cassi Caughey, William Whisnant & Ladonna Jenkins

*Weracoba Creek Watershed Plan*

Weracoba Creek of Columbus, Georgia has been listed on the Environmental Protection Agency's 303(d) list of impaired waterways since 1993. Research conducted by the Topics in Conservation class of Spring 2021 focused on the various factors contributing to the overall degradation of Weracoba's health. This was done in the hopes of identifying sources and solutions for the restoration of Weracoba Creek. Several components of the creek were surveyed, including the outfalls, banks, and streams of the creek. The survey was conducted via the Unified Stream Assessment (USA) forms.

Restoration potential was assessed for eight facets of the creek's health:

(1). Stormwater Outfalls (OT), (2) Severe Bank Erosion (ER), (3) Impacted Buffer (IB), (4) Stream Crossing (SC), (5) Channel Modification (CM), (6) Trash and Debris (TR), (7) Utility Impacts (UT), and (8) Miscellaneous (MI). These parameters were extracted from manual 10 of the USA forms. Of the eight stream components, we determined that the categories Severe Bank Erosion, Impacted Buffer, and Channel Modification were most influential in impacting the creek's health. Thus, restoration goals and objectives were generated to combat these specific factors. These potential suggested solutions were to decrease the slope of the banks whilst simultaneously replenishing the vegetative buffer in order to diminish bank erosion. These measures would also decrease the severity of Weracoba's channel modifications. Implementing these measures would potentially lead to a degree of restoration for Weracoba Creek.

Madison M. Coleman

*The Chattahoochee River Conservancy's Research on the Escaped Trash Assessment Protocol*

Columbus, Georgia is home to several creeks and streams that drain to the famous Chattahoochee River. For this project, research conducted during an internship with the Chattahoochee River Conservancy focused on preventing trash from degrading and polluting these tributaries in order to help protect the health of the Chattahoochee River. This project used a trap located in Bull Creek (Columbus, GA) to collect trash. The trap was cleaned out weekly, with each article of trash catalogued using a modified Environmental Protection Agency method referred to as the Escaped Trash Assessment Protocol (ETAP). Material type, product labels, and severity of material deterioration were all recorded as a part of the ETAP categorization. This data was then input into an Excel spreadsheet to determine the volume and frequency of trash, as well as what types of trash were found. This research could improve our understanding of what trash is present in the creek and could help identify and eliminate trash sources such as littering and illegal dumping. Overall, this research can help prevent pollution and protect our threatened waterways located in the Chattahoochee River watershed.

Zachary Culpepper, Summer Wilson, Hannah Jackson, Alexis Tucker & Savannah Wassmer

*Preventing Post-Traumatic Stress Disorder in Parents Experiencing Trauma Related To Newborn Complications and Prolonged NICU Stays*

PICO Question: How can we prevent or treat postpartum PTSD in parents who have experienced trauma with their babies due to premature birth complications or prolonged NICU stays with little contact?

Definition of Problem: Parents have been developing PTSD after having complicated births where babies are born prematurely or are sent to a NICU unit. Parents of preterm or NICU infants can experience a great deal of psychological and emotional distress, both during the hospital stay and after discharge. This type of PTSD affects both the mother and father and can negatively impact the parent's emotional bond to the infant.

Methods: Databases searched are CSU Nursing Library (Galileo), Medline, PubMed Central, and CINAHL. Search terms used: "NICU Parents PTSD, PTSD with preterm babies, PTSD in NICU families". We found two level 1 articles, one level 2 article, and two level 3 articles. The articles were all high quality.

Results: Various methods have been implemented as therapy to combat this development. The studies reviewed discuss methods such as internet guided cognitive behavior therapy, using relaxation techniques, sessions with licensed therapists, and social factors that can cause PTSD. The interventions offered improved overall quality of life, mood, and show a reduction of trait anxiety. Social factors associated with PTSD in prolonged NICU stays, such as stress during birth, lifetime psychiatric diagnoses, low social support, pregnancy risks, low birth weight infant, and mode of delivery.

Conclusion: Overall, results favor using whichever intervention is most convenient and suits the individual patient and family.

Brandon K. Corn

*An Evaluation of the power Consumption of Co-Authentication as a Continuous User Authentication Method in Mobile Systems*

Methods for continuous user authentication have become important with the proliferation of mobile devices in m-Health and humancentered systems. These methods must guarantee user identity with high assurance, authenticate without explicit intervention, and be power-aware. We present an evaluation of the power consumption of collaborative authentication (coauthentication) as a continuous authentication method. Coauthentication is a single-factor method in which multiple registered devices work together to authenticate a user, minimizing obtrusiveness while providing high user authentication assurance. To evaluate coauthentication's power consumption, we conducted experiments using two Bluetooth-enabled mobile devices and a stand-alone server in a local area network and running coauthentication continuously for eight hours. We found that the protocol uses approximately between 1.19% and 4.0% of the total power used by the devices. These results give evidence of the feasibility of using coauthentication as a continuous authentication method in mobile devices from the power consumption perspective.

Maya E. Davis, Dr. Stacey Blersch, Dr. Andrea Frazier & Dr. Dawn Truong  
*Food Desert or Food Oasis: A Ring of Unhealthy Food Chains Suffocating College Students*

Food insecurity has been an issue that has been estimated to affect households globally for decades. (Smith and Meade, 2019). Multitudes of research about food insecure households, age, and racial demographics have been conducted, but there is a distressing gap between food insecurity and college students. Research conducted by the 2016 Hunger on Campus Report has shown that 32% of food-insecure university students considered their food insecurity as a major, negative influence on their educational performance (Blumenthal and Chu, 2018). Food insecurity can often be connected to the lack of accessible, nutritious food within a certain mile radius also known as a food desert. My experiment shows that there is a food desert surrounding Columbus State University, as the closest fresher produce store is a 42-minute walk (approx. 1.29 miles) from the nearest main campus dormitory (Figure 2). This research was conducted as a starting point in an extensive study that will be investigated further in the future.

Carlie H. Dollar, Sierra R. Barlow & Samuel W.L. Dixon

*Shared and Unique Shell Shape between Flow Regimes Among Populations of Freshwater Snails*

A repeated pattern of shared shape variation across a common environmental gradient suggests that adaptive evolution molded those changes. Adaptations can arise from genetic polymorphism, phenotypic plasticity, or a combination of the two. In this study, we use the freshwater pulmonate snail, *Physa acuta*, to test for evidence of adaptive evolution by characterizing the shape variation between two habitats that were replicated on two streams. We collected snails from lotic (stream) and lentic (reservoir) environments and used F1 individuals (offspring) in a reciprocal growth experiment where individuals were placed in both their parental habitat and the opposite habitat to see how their shell shape was affected by habitat. Shape was characterized using geometric morphometrics, a multivariate approach that controls size and allometry, to determine shared aspects of shape variation between population responses to stream and reservoir habitats. The experimental design also allowed us to quantify the relative importance of fixed genetic variation and phenotypic plasticity in producing shape variation.

Madelyn E. Eysel, Rachel Howard, Kyle Nauman & James Jones

*The Restoration of Weracoba Creek*

Weracoba Creek is located near downtown Columbus, Georgia and is listed as a 303(d) impaired stream. This indicates that the stream is in poor health due to pollutants. Our restoration plan for Weracoba Creek focuses on the reach flowing through Dinglewood Park. Our evaluation, based on the Center for Watershed Protection, showed the stream banks are experiencing severe erosion and sedimentation due to a lack of a riparian buffer. Currently the city is responsible for cutting back the vegetation multiple times a year. The short grass does not provide much structural integrity to the bank, leading to this erosion. Invasive species are also allowed to grow. The removal of invasive species and planting of natives that are allowed to flourish is integral to improve bank stabilization and the overall health of the stream. We also focused on utilizing ArcGIS, a mapping and analysis software, to map potential sites for green infrastructure, to analyze streamflow data, and to create an interactive map that can be used for future restoration efforts.

Domenica Fertal & Jihyeon Park

*Effect of Calcination Temperature on Methane Combustion by PdO/Alumina Catalysts*

Palladium oxide on gamma-alumina catalysts were synthesized using a combination of the Vortex and Incipient Wetness Impregnation methods. The support was turned into a slurry in order to promote more uniform mixing and higher dispersion of Pd particles. Two different catalysts were prepared this way, but calcined at different temperatures: 250°C and 500°C. The catalytic activity for methane combustion was determined for each catalyst. The catalyst calcined at 500°C showed lower conversion with 48% and 82% at 250°C and 275°C, respectively. The catalyst calcined at 250°C showed higher conversion of 100% at both temperatures. Both catalysts were characterized by X-ray photoelectron spectroscopy. The catalyst calcined at 250°C had more PdOx than the catalyst calcined at 500°C. This suggests that PdOx is the active phase of the catalyst and explains why the catalyst calcined at 250°C had a higher conversion rate.

Sabrina N. Fisher & Mackenzie Coffee

*Extracting Baddeleyite and Zircon from the Marble Hill Hornblende Schist*

The Mineral Bluff Group of the Georgia Western Blue Ridge includes a metamorphosed volcanic unit, the Marble Hill Hornblende Schist. The age of the Marble Hill Hornblende Schist has been debated among geologists working in the Blue Ridge Region for the past several decades. To date, researchers have not been able to recover a suitable population of mineral grains appropriate for uranium-lead radiometric dating from the Marble Hill Hornblende Schist due to the mineralogic nature of this low silica rock. Instead, silica-poor metavolcanic rocks like the Marble Hill Hornblende Schist tend to incorporate uranium into the zirconium oxide mineral baddeleyite or in small zircon populations that can be challenging to extract using standard mineral separation techniques. In order to improve the extraction of the fine-grained minerals from the rock unit, we focused on perfecting the automation and separation of baddeleyite and zircon from the more common, undateable minerals in the Marble Hill Hornblende Schist. Utilizing mineral separation techniques incorporating a hydraulic sorting table, Frantz isodynamic magnetic separator, and heavy liquids, we hope to perfect the



extraction process in order to concentrate dateable minerals from the Marble Hill Hornblende Schist.

Kayla M. Fortune & Isabella Nunez

*Identifying Trends In Daily COVID-19 Cases and COVID-19 Vaccines Being Administered Through Data Analysis*

The rise in the number of COVID-19 cases around the world poses a need for efficient and equitable vaccine strategies that consider logistical and demographic challenges. Our team analyzes states within the United States of America and the plans they have in place for the administering and distribution of the COVID-19 vaccine. Through various data analysis tools and statistical analysis, the team aims to identify factors that contribute to the vaccine being distributed and administering within these different regions, observe the trends of new COVID-19 cases, and show the rate of change in new COVID-19 while vaccinations are being administered.

Shakeria A. Gathers

*The Effects of Social Media on Mental Health*

Background: Popular social media platforms such as Snapchat and Instagram, have increased in popularity over time among adolescents. Even though the use of social media positively benefits the companies, there are concerns that social media may be negatively impacting adolescents' mental health. A study is needed to gather information on how social media affects the mental health of adolescents.

Goal: The goal of the study is to examine whether high social media use intensity and addiction-like social media use problems are associated with low mental health and whether these associations are mediated by other factors.

Methods: We will review several scholarly and peer reviewed articles that were published in 2016- 2018 to determine the effect of social media on young adolescent mental health. We intend to select peer reviewed articles from studies that used longitudinal study design and analyze them to determine the relationship between social media use and mental health. We will search for these published articles from the PubMed, Science Direct and the PsyArticles database.

Expected Results: High social media use and addiction are likely to negatively affect adolescent mental health. Depressive symptoms, less face-to-face contact with friends, lower averages in life satisfaction and cyber victimization are all factors that could likely be associated with the effect of social media.

Conclusion: Information gathered from the study can potentially be used to educate adolescents on how too much social media can negatively impact their mental health and to raise awareness as well.

Jali A. Hoehn

*A Comparison Between Propagandistic Music of the Nazis and the Neo-Nazis*

Aural propaganda, specifically in the form of music, has been utilized for political gain by the Nazis and is currently being utilized by the Neo-Nazis today. While both the Nazis and Neo-Nazis have used music as a means of spreading their ideals, both have done so with different communication technologies, different genres of music, and different propaganda tools. While the Nazis only used two popular genres of music and were confined to using only the radio as a communication technology, the music of the Neo-Nazis has been spread over the vast Internet in a variety of genres. However, the historical and social context of both the Nazis and Neo-Nazis are examined and used to form conclusions about the effectiveness of their propagandistic music. The propaganda techniques employed in the music of the Nazis and Neo-Nazis affect the deliverance and acceptance of their messages.

Kenya S. Isler

*Using AI to Improve Student Learning in Abstract Algebra*

In this research group, we consider developing game-based software that will offer mathematics majors an opportunity to better understand complex concepts in Abstract Algebra. Students will get a deeper understanding of left and right identities and zeros, noncommutativity, idempotents, sub semigroups, and subgroups with visual representatives of finite semigroups and groups.

Our methodology utilizes the python module pygame to create a checkerboard type user interface that allows the student to use intuition to guess at

appropriate board entries that will correctly define abstract multiplication. A simple python module will determine whether this abstract multiplication satisfies the requirements for semigroup or group.

This research will focus on the form of machine learning or genetic algorithms. The application intelligence occurs when the student learner asks to see an example of a semigroup or group to guide the student's efforts at forming a personalized abstract multiplication. There are free, open-source python modules that will assist in the rapid development of our AI support.

Our plan for the development of this project is to first design a user-friendly interface for the student-learner- this phase is now under development. The second phase consists of the creation of a simple python module that will check the connection of the students' guess at an abstract multiplication. The final phase is to determine whether deep learning or genetic algorithm AI designs will give the quickest and most valuable responses to the student learner when the student requests a sample abstract multiplication defined in table form.

Haley B. Johnson

*Novelties in Ecuadorian Styracaceae: Disentangling the Identity of a New Species or New Genus*

During my Genetics class, I had the opportunity to gain lab experience firsthand with Dr. Kevin Burgess, Prof. Alvaro Perez (visiting Scholar from Ecuador) and a MS in Natural Sciences graduate student, Chowon Han. Here, I present a poster on the techniques used to confirm the identity of a plausible new species of tree collected from the Andean region of Ecuador. In total, we screened samples from a single specimen collected from this region. This analysis included, but was not limited to, plant morphological techniques using light microscopy, DNA Barcoding (DNA isolation, PCR, and DNA sequencing of the rbcL and matK gene regions of the chloroplast genome), and Scanning Electron Microscopy (SEM) of fruit, trichomes, and leaves. Preliminary analysis involving 9 replicate samples isolated for each gene region, indicates that the plant specimen is indeed a new species of *Styrax*, if not a new genus of tree belonging to the family *Styracaceae*; we continue to use phylogenetic analyses to confirm the latter and results are pending. This research

experience allowed me to learn a number of techniques in the field of plant ecological genetics that I will continue to use in my senior research endeavors on this project.

Michael J. Lambert & Lindsay Wright

*Schedule Keeping in Alzheimer's and Dementia Therapy in the Elderly*

Background: Today, someone in America develops Alzheimer's every 68 seconds. Memory problems associated with Alzheimer's and dementia can lead to an inability to perform self-maintenance or life sustaining regular daily activities, including eating, drinking, bathing, or taking medications. Daily structure can help decrease these undesired behaviors such as aggression, relentlessness, and agitation. A familiar pattern can help transfer a daily routine into the long-term memory portion of the brain. Alzheimer's disease is a recurring memory problem, caretakers adhere to strict time schedules for the treatment and care of those suffering through these memory problems.

Goal: By creating an environment of familiar routines and daily activities, scheduling will allow the patients to feel comfortable and calm. It gets patients through the day. The early use of scheduling could be used to delay the onset of Alzheimer's disease.

Methods: We plan to use a qualitative methods approach to measure the quality of life, stability, and effectiveness of relearning strategies measured using memory retention techniques. The data collected will provide evidence that schedules for patients improves their daily life and mood.

Results: Schedule keeping is a strong therapeutic support measure for treatment of Alzheimer's disease. This still gives the patients a sense of independence and functionality as well. Having caregivers keep patients on a schedule also prevents confusion and other health issues that may arise.

Conclusion: Information from this study will be used to implement schedule keeping in Alzheimer's therapy for daily life functioning. In turn this will prove that schedule keeping does improve daily functioning and task for the patients, along with making caregivers day easier as well. The patient's moods are also more positive than having an angry outburst.

Maria Paula Loria Valerin

*Handel's Harp Concerto: History and Performance and History*

Greatly known for his operas and oratorios, Handel is responsible for one of the sole existing harp pieces of this period, the Concerto in B-flat VI, Op.4. Originally composed for the triple harp, Handel published this concerto alongside concertos for organ in the Six Organ Concertos Op. 4 as Concerto VI. The B-flat Concerto was used in his choral ode Alexander's Feast. The B-flat Harp Concerto became a standard work in the modern harpist's repertoire, leading to the development of different arrangements and transcriptions.

To achieve the composer's vision of how a piece should be performed, it is important to support and understand a composer's musical decisions, regardless of their adherence to historical guidelines. This paper considers what historically-informed performance means for the harp by examining the information in Joachim Quantz's treatise, *On Playing the Flute*, and applying Quantz's ideas as a reference to baroque performance practice. It also considers Carlos Salzedo's transcription of the B-flat Harp Concerto (1945) for the modern pedal harp. This transcription presents authenticity issues because of Salzedo's use of modern harp techniques, specifically the use of thick chords, long cadenzas, loud dynamics, fast tempos, and extended harp techniques. These elements make the B-flat Harp Concerto a piece that showcases the brilliance of the modern harp; however, Salzedo's choices of chords, cadenzas, ornamentation, tempo and dynamics contradict both historically "accurate" performance practice and Handel's original ideas. This paper will discuss whether Salzedo's piece is either historically-informed, a harp showcase, or something in between.

Ashley E. Lowe, Sarah Barnes, Susan Hodge, Nicole King & Caitlynn Weeks  
*The Use of Basic and Interactive Dressing in Reducing Surgical Site Infections*

PICO Question: In post-operative patients, does the use of advanced and interactive wound dressings decrease the number of diagnosed surgical site infections compared to basic sterile dressings?

Definition of Problem: Surgical site infections (SSIs) are preventable complications that occur as a result of bacteria present on the patient's skin or

from the environment infiltrating breaks in skin that occur within 30 days of surgery

**Methods:** A literature search was conducted using the search engines Medline, Google Scholar, Galileo, and PubMed to research the current practices for post-operative dressings to prevent surgical site infections. The keywords used to search for articles relevant to the EBP question included “interactive dressing,” “standard dressing+interactive dressing,” “advanced dressing+SSI,” and “SSI prevention.” Three of the articles were level one Randomized Controlled Trials and good quality. Two articles were level two and of high quality. One was a non-randomized control study and one a cohort study.

**Results:** Four studies suggested that interactive dressings (DACC- impregnated dressing (n=3) and Ag surgical dressings (n=1)) are effective in reducing surgical site infections in post-operative patients compared to standard dressings. However, a cohort study solely focused on standard procedures observed that only 2% of the patients developed an SSI.

**Conclusions:** Although four of the studies contain consistent and supportive evidence, the cohort study suggests that further research should be performed for advanced/interactive dressings to become the near future norm for decreasing SSIs and maintaining cost-effectiveness for patients.

Jasmin Mercedes, Beonica Campbell, Deangela Collins, Arthur Evans, Michelle Johnson & Brittany Taylor

*Best Ways to Reduce Hospital Acquired C. diff Infection in Among Patients in the Clinical Setting*

**PICO Question:** Amongst patients in the hospital setting, what are the best ways to reduce hospital acquired C. diff infection?

**Definition of Problem:** According to the CDC, Clostridium Difficile (C. diff) is a highly contagious bacterium that causes severe diarrhea and colitis and is easily transmitted from person to person or from contact with a contaminated surface and then inadvertently spread to patients. The CDC’s only transmission prevention protocol is washing hands for 20 seconds with soap and water. If left unmanaged, it spreads rapidly throughout the clinical setting where it originated. C. diff’s main treatment option is vancomycin or

fidaxomicin. The issue that we continue to face is the transmission of the infection in the hospital setting.

Methods: This literature review used EBSCOHost, PubMed, CINAHL, Embase to search for the best practices to prevent the C. difficile infection. The search terms used were “clostridium difficile”, “C. diff”, “C. difficile”, “C. diff prevention”, and “PPE”. The article search yielded the following results: four good quality Level III and two high quality Level III articles.

Results: The interventions to decrease the C-Diff transmission rate are hand hygiene and doffing PPE in the presence of a CNL, accurate and precise laboratory testing with validated equipment, cleaning commonly used surfaces routinely, knowledgeable housekeeping services, and proper isolation protocol adherence.

Conclusions: As a result, it can be concluded that a recommendation for proper hand hygiene and cleaning procedures taught through staff education will be the most effective to reduce hospital acquired C. diff infection.

Miguel A. Montiel Cubas & Suk Lee

### *The Power of Internet of Things*

Internet of Things (IoT) is a new and disruptive technology that is changing the lives of millions and can potentially influence billions of people every day, just like the Internet does. With IoT, you have full control of the hardware and the software, and you can choose exactly what you want to add or use. By using the Raspberry Pi and NodeMCU ESP8266, this project aims to show the power of IoT, how end devices communicate with a gateway node. The sensors exemplified with PIR motion sensor and DHT11 temperature and humidity sensor, are connected to the NodeMCU. Using MQTT protocol, the NodeMCU can send the readings of the sensor values to a gateway node (Raspberry Pi). Then, the Raspberry Pi can listen to the MQTT topics of the publisher (NodeMCU). This is incredibly useful, can be easily expanded, and allows us to automate tasks of things. Moreover, with security modules, the efficiency of MQTT and other protocols will be tested to see which ones more reliable, and which ones are faster. The possibilities are endless, it is possible to automate the lights turning on or off with motion sensors, or sound sensors for clapping,



to have a fully capable alarm system, and much more. With this project, the goal is to show the power and importance of IoT and how it can help you, and anybody, in your day-to-day life.

Jiro J. Newton & Julie Fernandes

*Best Nursing Interventions for Prevention of Ventilator-Associated Pneumonia*

PICO Question: What are the best nursing interventions, currently in use in other countries, to ensure that critical care patients do not develop ventilator-associated pneumonia (VAP)?

Definition of the Problem: Ventilator-associated pneumonia (VAP) is defined as the diagnosis of pneumonia that occurs within 48-72 hours after endotracheal intubation. Ventilator-associated pneumonia is the second most prevalent nosocomial infection acquired in critical care settings. Many countries have implemented best practices in hopes of reducing incidences of VAP, as this complication negatively impacts quality of care.

Methods: A literature search was conducted on PubMed, EBSCOHost, and the Cumulative Index to Nursing and Allied Health Literature (CINAHL) database, utilizing pertinent search terms “critical care patients”, “ventilator associated pneumonia”, “prevention”, and “best practices”. There were two randomized controlled trials and three quasi-experimental studies. When researching for this evidence there was a large amount of volume related to the topic, but the levels of evidence were found to be rated at level I and II with a quality rating of good.

Results: Medical facilities across the globe prioritized oral hygiene as the most effective best practice to reduce the occurrence of ventilator-associated pneumonia. A majority of studies placed emphasis on ensuring the patient is consistently in the semi recumbent position. This position is the optimal body position and angle to reduce VAP frequency.

Conclusions: Ventilator-associated pneumonia is an adverse, clinically significant, and preventable nosocomial infection. Reviewing best practices



implemented across countries and evaluating any needed changes are ideal to maximize high-quality patient care outcomes.

Lessie Ousley, Michelle McDonald, Nicholas Doherty, Kanequa Copelin & Josephine Draper

*Different Methods of Managing or Controlling Postpartum Hemorrhage*

PICO Question: What are the best methods for effectively treating postpartum hemorrhage in the hospital setting?

Definition of Problem: Postpartum hemorrhage (PPH) is defined as excessive bleeding after childbirth. Out of an estimated 500,000 women, 1% experience PPH each year. Excessive bleeding is greater than 500 mL with vaginal births and greater than 1000 mL with a cesarean birth. PPH is the cause of 12% of maternal deaths in the US annually and affects women ages 35 or older.

Methods: Galileo, Google Scholarly, CDC, and MEDLINE were the databases utilized the search terms used: “Postpartum Hemorrhage” and Invasive procedures. We found three level 1 RCT articles, one level 2 article, and one level 3 article. Three of the articles were high quality and two were good quality.

Results: Four of the five studies recommend that invasive procedures be performed to prevent or control postpartum hemorrhage. We found four articles that suggested invasive procedures which included blood transfusions, B lynch suture, modified B lynch suture, and ligation procedures are more efficient in preventing post-partum hemorrhage leading to mortality and one article that suggested non-invasive procedures which included treatment with Recombinant human FVIIa (rhuFIIa) are just as efficient. Some individuals required a hysterectomy, a removal of the uterus.

Conclusion/Recommendations: Based on our findings, we recommend that invasive procedures continue to be performed to prevent or control post-partum hemorrhage, and consider a larger randomized controlled trial for further investigation into treatment of Recombinant human FVIIa (rhuFIIa).

Grace A. Pippas

*Artificial Intelligence: An Illuminated Manuscript Creation Story*

Technology pervades our lives in every way, yet will we ever reach the point as a society where we refer to Artificial Intelligence as autonomous individuals, as we do to one another? We still treat AI as if it were a tool rather than an autonomous being, even though AI is infinitely smarter than the human brain, and it also makes its own decisions technically speaking. For my final project, I was quite curious to see how AI could become "conscious", and what such a word even meant, through employing a story humans have used for tens of thousands of years to depict the development of consciousness, vulnerability, evil, and knowledge of the future, among other things: the story of Genesis. In replacing key characters and settings, starting with the development of Ada Lovelace's "Poetical Science" as an example of order out of the numberless and computerless void of chaos, Man builds HAL, the AI from 2001: A Space Odyssey, out of the "dust" of numbers. As Hal journeys through his electronic Eden aboard the Discovery space ship, perhaps the snake had indeed been set there before him, and his eventual downfall was inevitable.

Kathleen E. Rhinebolt

*Jury Decision Making with Female Veteran on Trial*

This project focuses on jury decision outcomes when it comes to sentencing female veterans with PTSD compared to male veterans with PTSD. The male portion was completed in Spring of 2020 and presented at SPSP 2020. This project collects results for the female portion, then comparing the results. A participant is presented with one of three crimes. The crimes the veteran has committed become more severe in nature, starting with a DUI, then an assault, and then an armed robbery. This is a natural progression towards violence that can sometimes be seen in people with PTSD. We believe that if a jury is presented with an alternative to the standard 'guilty' and 'not guilty' sentencing, then they will choose that alternative. We presented the jury with the option for the veteran to 'receive treatment' instead of just displaying 'guilty' and 'not guilty'. The reason for the comparison between the sexes is so that we may see if the knowledge of the woman being a veteran or having PTSD overcomes the bias towards women that is often seen by female criminals receiving lighter sentencing for the same crimes their male counterparts have committed. In the male veteran study, we did not see the

drastic effects of offering treatment that we were hoping for. The 'guilty' verdict was the most common verdict chosen. The more severe the crime became, the more likely a participant was to choose the 'guilty' verdict, as expected. 'Send to treatment', was chosen more often than 'not guilty'. Similar to the 'not guilty' verdict, the rate for treatment went down as the crimes progressed. While people did choose 'send to treatment', it was not too different from the 'not guilty' verdict. We saw the anticipated outcome of participants choosing 'guilty' as crimes became more severe. This is important to note because it may show that participants become less lenient toward mental illness as it starts to become more severe, which is perhaps the most important time to get help for those suffering. Sending somebody with a mental illness to prison may make it worse, resulting in a progression of severity in crimes when they are released.

Isabelle Rodriguez, Dominic Fico, Zijie Lin, Julie Wilson, Adaimoabasi Udo, Monique Echevers, Shanina S. Johnson, Dr. Monica Frazier, Dr. Lauren King & Dr. Kerri L. Shelton

*Synthesis, characterization, and biological activity of asymmetric N,N'-bis-substituted triazolium salts as potential antitumor and antimicrobial agents*

The development of a cancer therapeutic that not only possesses antiproliferative abilities but also exhibits effective antimicrobial activity has increased in importance due to patients' compromised immune systems. N,N'-bis-substituted triazolium salts have begun to demonstrate their biological activity. Literature has shown the anti-proliferative ability of N,N'-bis-substituted-1,2,4 triazolium salts against prostate (PC-3) and breast cancer (MDA-MB-468) cell lines. Similar in structure, 1,2,3 triazolium salts have shown promising bactericidal effects and were more effective in comparison to the 1,2,4-triazolium parent. An investigation into the structure activity relationship (SAR) between substituents and antimicrobial ability has noted the naphthylmethyl substituent most successful when produced in a symmetric form. This has encouraged an investigation into the development and testing of asymmetric N,N'-bis-substituted-1,2,3 triazolium salts for effective antimicrobial activity. Enterococcus faecium, Staphylococcus aureus, Klebsiella pneumoniae, Acinetobacter baumannii, Pseudomonas aeruginosa, and Enterobacter species (ESKAPE) are the most common pathogens

contributing to infections in the clinical setting. In order to fully understand the utility of the triazole ring as an antimicrobial agent, we present a structure activity relationship of N,N'-bis-substituted 1,2,3-triazolium salts synthesized with varying asymmetric substituents. These novel N,N'-bis-substituted 1,2,3-triazolium salts will be synthesized, characterized, and tested for their biological activities when used as antimicrobial agents.

Destin Smith, Jessica Buzzell, Olga Hernandez, David Parks, Jessenia Rodriguez & Haley Worrell

*Patient Safety: Implementation of the Surgical Time-Out*

PICO Question: In the adult surgical patient, how does the implementation of a surgical time-out increase patient safety and decrease surgical error?

Definition of Problem: Without communication among staff members of essential patient data prior to initiation of surgery, patient safety is compromised and the incidence of surgical error increases. Essential patient data can include patient name, date of birth, allergies, intended procedure and location. Many instances of surgical error are easily avoidable and not an acceptable cause for compromised patient safety.

Methods: The search was conducted using CINAHL, Nursing and Allied Health (ProQuest) and Medline databases. The following search terms were used: "Surgical AND time-out", "Wrong site AND surgery", "Wrong patient AND surgery", and "Allergies AND surgery".

Six quantitative articles were evaluated by each group member, two articles being quasi-experimental studies (Level II), while the remaining four articles were non-experimental studies (Level III).

Results: The evidence gathered suggests that the implementation of a surgical time-out both increases patient safety and decreases surgical error.

Additionally, providing staff members with education prior to initiating the time-out has proved to increase compliance and satisfaction.

Conclusion: Patient safety can easily be achieved and increased with the inclusion of a time-out to surgical procedures. Without its implementation, the incidence of surgical error drastically increases.

Recommendations: The studies reviewed would be more conclusive if they were randomized and more diverse in their efforts. A definitive checklist would have allowed a more preferable comparison between studies.

Rasheed S. Tillman & Antonio Hardy

*The Impact of Social Support and Stress on Life Satisfaction*

Feeling satisfied with life is an important element that we all want to experience during our lifetime. In order to do so we needed to find ways in which we can raise our life satisfaction levels. Research has shown that there is evidence that lends support to life satisfaction being influenced by both perceived stress and perceived social support. In this current study we examine the impact that perceived stress and perceived social support has on one's life satisfaction. We designed an online survey in which 79 Columbus State University college students submitted answer to three scales that we used to calculate their results. Our hypothesis was that the more perceived social support one has the higher their life satisfaction will be and the more perceived stress they experience the lower their life satisfaction will be. Our results indicated that both perceived stress and perceived social support are significantly correlated with life satisfaction. Our results also indicated that both perceived stress and perceived social support are predictors of life satisfaction.

Sabrina P. Warren, Abigail Blankenship, Jessica Dixon, Kaleigh Bishop & Kendall Fritzky

*Breastfeeding and Nipple Confusion*

PICO Question: Our question being, in breastfeeding infants, does pacifier use cause nipple confusion?

Definition of problem: The term nipple confusion or nipple preference, as defined by La Leche League International, has been used to describe "an infant's fussiness at breast or frustration when they are having problems switching from a bottle nipple and breast, before breastfeeding is well established. If an infant using a pacifier has nipple confusion, the infant may develop suckling habits that either do not induce the let-down in the mother's milk or cause an ineffective latch on the mother's nipple.

Methods: The databases searched included ProQuest, EBSCOHost, and CINAHL. Supplemental research, such as information from the CDC and “Healthy People 2020,” guided us by providing information about the national breastfeeding rate. The search terms we used consisted of “breastfeeding”, “pacifier use”, and “nipple confusion.” We found three non-experimental studies with two good quality and one cross sectional with high quality. We also used a randomized control trial with high quality and level 2 quasi-experimental with good quality.

Results: The volume of articles relating to this topic were very minimal. Many of the articles we were able to find were dated back to 2010 making them not applicable for our research.

Three of the articles concluded that pacifiers do cause nipple confusion, and the other two concluded that there was no correlation between the two.

Conclusion: In conclusion, there is not enough supporting evidence to conclude that pacifier use causes nipple confusion in infants.

Marianne D. Weaver

*Postpartum Depression: Exercise vs. Pharmacological Interventions*

PICO Question: Can habitual exercise and healthy lifestyle choices positively affect women with postpartum depression enough to negate or reduce the need for pharmacological interventions?

Definition of Problem: Postpartum depression, medically abbreviated as “PPD,” is a form of clinical depression that can affect women after childbirth. PPD symptoms are more severe than those of the “baby blues” which commonly occur in postpartum women when their hormone levels are adjusting. In the United States, PPD is often treated with medication, such as antidepressants or SSRIs.

Methods: Databases we used included CINAHL, GALILEO, and EBSCO. The specific terms we searched for were “postpartum depression and exercise/physical activity,”

“postpartum depression and healthy diets,” and “postpartum depression and treatment.” Each of the research articles that were found on this topic were classified as Level I, High Quality evidence findings

Results: When analyzing the data from each of the articles, the combination of all of the participants exhibited a diverse group of women ranging in age, ethnicity, and socioeconomic status. In all studies but one, exercise did play a part in decreasing the onset and severity of postpartum depression, therefore negating the need for pharmacological intervention. All studies we selected were focused internationally, including Australia, Brazil, Canada, and the United Kingdom.

Conclusion: This is not to say that all pharmacological intervention can or should be eliminated, but that the amount of medicine or the duration of time on an antidepressant required can be potentially reduced.

Lydia K. Whetzel, Harold Stansil, Tynasia Young, Shondra Jones & Tigist Gedrago

### *Maternal Hypertension in African American Women*

PICO question: How can maternal hypertension rates in African American women be lowered to the national average to prevent complications and maternal mortality?

Definition of Problem: High blood pressure, or hypertension, is one of the leading causes of pregnancy complications in the United States. Preeclampsia, a potentially fatal complication of pregnancy characterized by high blood pressure and organ damage is one of the leading causes of pregnancy related deaths among African American women.

Methods: The databases that were used for research include: Google Scholar, Galileo, and PubMed. Search terms used were “Preeclampsia”, “Eclampsia”, “comorbidities”, “prenatal or postpartum complications”, “racial disparities”, “mortality”, “maternal mortality”, and “preeclampsia in pregnant African Americans”. A total of five articles were used. Of the five articles, the evidence levels were two level 1 high control quality, two level 2 good quality, and one level 3 good quality. The evidence types for the articles included one nested



case control, one quasi-experimental, and three retrospective case study controls.

Results: Based on the evidence received from the articles, systematic metabolic disruptions, genetic factors (genotype APOL1), socioeconomic status, limited access to healthcare, limited awareness, and echocardiographic abnormalities all play a role in determining the risk for preeclampsia in AA women.

Conclusion: Research suggests that African American women were more likely to be at risk for preeclampsia and were more likely to suffer an adverse outcome. Emphasis should be placed on further research into whether controlling comorbidities and other risk factors would alleviate racial disparities among these women.

Jacob A. Woessner

#### *A Novel Device for Conducting Recrystallization*

In this project, a novel device for conducting recrystallization was designed and assembled. This device makes use of an IR thermal camera in an attempt to detect the recrystallization process. This was achieved by using a Raspberry Pi computer and data python library to make a thermal camera GUI. This GUI will allow us to have a greater understanding of the recrystallization process in real-time. We hope to demonstrate that this process can not only be observed, but also automated in some fashion using an external heating element. In our project was used table salt as a proof of concept, but we hope to use this in an actual research setting with other compounds. This project's primary application is to make the recrystallization process much easier to do. This frees up time and allows research to be conducted much more efficiently.



## Oral Presentations

Kayla S. Ambler & LaQuaele Jackson

*Exploring Culturally Relevant Topics with Science: What is the best product for a braid out?*

The experiment we chose is relevant to our lives and we hope will impact yours. As future educators, it is important to acknowledge how women, especially of color, have taken on lead roles and continue to thrive as educators to our youth. We are black women entering the educational field with the hope of growing strong, efficient, and well represented citizens for the many generations to come. To meet these qualifications, we must incorporate diversity and acceptance in all subjects, particularly science. We are black women with natural hair, meaning our hair is unaltered and true to form in its natural state and oftentimes it can be hard to manage natural hair. So, we wanted to conduct an experiment that was interesting and something that could test a real problem in our lives that could help us in the educational field as well. "What is the best product for a braid out? ", stuck out to us as we challenge the normal status quo of science experiments along with challenging ourselves and others to acknowledge how diversity can be implemented into a science experiment. . We explored several product types and did observations over a span of 2-4 days per product in order to determine the quality of the product on a braid out based on Laquael and myself using the products on our hair. As we try to be as culturally diverse and inclusive as possible we have found a way to accept and encourage diversity in culture and personality in students through science. By conducting a culturally specific experiment, we are putting ourselves in our student's shoes and answering a question that our community needs answered. Successfully conducted projects like this will encourage our students in the future of all races/ethnicities to be accepting and how culture can be included in not only teaching and learning science but doing science.

Caroline G. Behringer

*Increasing Representation in Studies*

I want to increase the equal representation of different demographics in psychological research. Not having equal representation creates a situation in which understanding of people is unfair. One example of this would be the

Stanford Prison Experiment. This experiment was done on male college students, but it was used to describe human behavior as a whole. This was also an unethical study (Texier 2019). The issue is that psychologists assume that this behavior is the same across the human race, but the studies are not representative enough to make that assumption. The idea that people are violent when put into a position of power may not hold for different races or genders, but it is difficult to make up for the underrepresentation of studies that are too unethical to be replicated. The psychology field needs to have more inclusive studies that are valued more in psychological studies rather than ones that do not describe the behavior of everyone. This will work in making a better place for those in society. Some of the possible causes of this inequality are racial and gender bias during recruitment and studies in the past that involved the mistreatment of minorities that would lessen the number of volunteers from different subgroups. It is important to display experiments in which participants get fair and ethical treatment while also incentivizing researchers and participants. Some possible incentives might be money or discounts. Another could be that researchers would lose out on grant money if their study was not inclusive enough. If a good solution is found, people will receive better treatment in the psychology field, and we would have a broader understanding of people.

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Davis, Mary E

Mentors: Michael G. Newbrey & Jennifer Newbrey

*Factors that Affect Dental Extractions in the Small Animal Veterinary Practice*

Dental health is an extremely overlooked field of veterinary medicine, while dental disease is one of the most prevalent issues in dogs. Extractions can be a very complex surgical procedure, and are indicated when dental disease or fracture has compromised the root or pulp of the tooth. This study was performed to determine factors that influence extractions in a small animal veterinary practice. Overall, extensive dental disease and small animal size can increase the frequency of extraction, while increasing weight seems to

decrease frequency. Dental extractions in large dogs were most often due to a fracture, and the most commonly fractured teeth were those of the carnassial pair. Smaller dogs were more likely to lose teeth due to disease, and toy and hound breeds were the most likely to receive extractions. There was no significant difference between age and number of extractions, which does not align with previous research. Further research is necessary to determine factors that make certain breeds more likely to suffer from dental abnormalities than others.

Ashlyn N. Dewberry

*A Tale of Two Pandemics: A Comparative Analysis of U.S. Government Responses to the 1918 Influenza and COVID-19*

This research seeks to analyze the differences between the U.S. government's responses to the 1918 Influenza Pandemic and the COVID-19 Pandemic. Data on the implementation of nonpharmaceutical interventions (NPIs) by state and local governments in both 1918 and 2020 serves as the primary tool for the analysis of evolutions in government authority, inter- and intra-government behavior, as well as differences in NPI policy choices.

Charles Boggs

*Difficulties in Maintaining Exercise and Solutions*

Many people across the United States find exercising on a routine basis difficult for various reasons. These can include, but are not limited to: inability to find time, lack of motivation, or mental health issues. The purpose of this presentation is a self-introspection to find root causes as to why physical fitness is difficult to maintain for myself, analyze these to determine whether or not they are solvable, and develop efficient and effective solutions to those that are. Solutions could be as simple as finding more efficient ways to organize time using planners. The development of better sleeping habits such as not using blue light emitting devices, not eating within an allotted time period before sleeping, or even just maintaining similar sleeping times are methods of solving irregular sleeping habits. Visual and motivational reminders also serve as methods of encouragement that may be useful. In the case that a root cause can not be eliminated, we then try to find effective ways to mitigate the effect that they might have.

Jonathan Y. Davidson, Jr.

*Leistung und Luxus, A study of the German Automotive Market*

The year was 1885, and Karl Benz had been working feverishly to finish his design of his horseless carriage. Fascinated by bicycles his entire life, Benz had looked to them for inspiration. The large wire wheels were prepared and ready to roll, the horizontally mounted four-stroke engine between them was humming along nicely. That day, Benz thought he was just firing up his Benz Patent Motorwagen but little did he realize, he was firing up an entire industry that would one day see the ordinary driver being able to reach nearly 200 miles per hour. *Leistung und Luxus, A study of the German Automotive Market* takes a peek at the top German auto manufacturers and analysis their competitive strengths, weaknesses, perceived value, and how each brand differentiates themselves in a crowded growing, and constantly changing environment. For this analysis, I will be using cluster analysis to identify the brand classification, and a regression or a forecast analysis to predict the upcoming sales for the various brands mentioned in the study.

Madelyn E. Eysel

*A Semester as a Drinking and Wastewater Lab Intern at Columbus Water Works*

This spring I have served as a Drinking and Wastewater Lab Intern at Columbus Water Works. As an intern I had the opportunity to gain an in-depth understanding of the physical and chemical treatment techniques used for drinking and wastewater treatment. I performed many laboratory procedures involving water quality tests such as fecal coliform, e. coli, biological oxygen demand (BOD's), volatile acids, metals, and many more. Running these tests gave me the chance to operate higher level analytical equipment and then analyze the results obtained (some of which I will share). Collecting field samples from creeks and rivers and familiarizing myself with watershed protection protocols are just a couple of the other responsibilities I had. It was a wonderful opportunity to gain real world experience in the environmental science field and seeing first hand how I can apply my knowledge and skills learned in class.

Chase A. Funk

*First Gulf War Propaganda: The Power of Television, Narrative, and Charisma*

In August 1990, Iraq, under the leadership of Saddam Hussein, invaded Kuwait. Seven months later in January 1991, an American-led coalition launched an operation to drive Iraq back out. What followed was a tense month-long air campaign, then a decisive three-day ground war. As the physical war waged, a propaganda war was fought on Western television sets as the thousands of reporters in the Middle East fought against the official U.S. Military information channels. Chief among these channels were the daily press briefings given to journalists by the U.S. Military; what was said in these press briefings would go on to be broadcast throughout the entire Western media. At key points in the war, General Schwarzkopf—the Commander of U.S. Central Command—would take the stage to give charismatic briefings and “down-to-earth” answers to reporters’ questions. General Schwarzkopf gave his most famous briefing after the unprecedented success of the first several days. He walked away from this briefing a war hero, and American pride in country and military increased greatly. Caught up in the excitement that this U.S. propaganda inflamed, the mainstream media failed to report at this critical time that 20,000 Iraqi soldiers died during the short campaign. By analyzing Schwarzkopf’s press briefing, how he conducted himself, and how the media chose to cover the briefing, we can reflect on the shortcomings of new media technology and the dangers of a charismatic leader in media coverage.

Jali A. Hoehn

*Baroque Period Orphanages and Women’s Music Education Accessibility*

Until the eighteenth century, and even throughout the nineteenth century, women did not have access to their own music education. This was due to the notion that women were irrational and too unstable to receive an education. Some of the first females in a lower socioeconomic class to receive a music education were those who studied in ospedali, orphanages during the Baroque period. This project will discuss the music education these girls received, especially those from the Venetian ospedale where Vivaldi taught. It will also discuss how these female musicians were viewed by society, impacted by the biases and cultural norms that were held by society before and during the Baroque period. By analyzing surviving records of the girls who studied at the ospedali, conclusions are made about their musicianship. This project explains

how contemporary gender norms impacted the records of the girls in the ospedali, their role in history, and how this contributed to providing greater music education accessibility to all women.

Alejandro Huerta, Spencer Payne, Eloghosa Obasuyi & Kayla Fortune  
*Software Reverse Engineering Malicious Software to Enable Cyber Defense*  
Remote Access Trojans (RATs) are among the most dangerous threats that cyber security analysts face today. In this study we analyze two well-known RATs; namely, Nanocore and njRAT, to exploit them to ultimately block them and change their course. In this paper we share steps in analyzing the RATs, our findings, and our work running a dll proxy against the njRAT. We successfully have njRAT change its course of action and run our code. All tools used in our study are open-source tools that are free of charge.

Alejandro Huerta, James Robertson & Sahana Deb  
*Adding Integrity to Homomorphic Encryption Schemes*  
Homomorphic encryption performs mathematical operations on encrypted data without decrypting the data. Homomorphic encryption gives the user confidentiality over-stored, transmitted, and processed data to untrusted parties. However, homomorphic encryption cannot ensure that the data that was processed, was not modified during transmission from host to host or during computation. In this study, we share our findings on establishing integrity to homomorphic encryption. By using Microsoft SEAL open-source library and EVA CKKS compiler. We show our implementation of Bedford's Law and homomorphic encryption. Also, we demonstrate how a hashing algorithm may be used to further provide integrity for homomorphic encryption applications.

Michael J. Lambert & Bobbi Bass  
*Suicide Statistics*

Background: Despite numerous suicide prevention programs, suicide death rates have been increasing in the US. Although suicide affects all age groups, it is the second leading cause of death for people 10 to 34 years of age. Preventing suicide remains a public health concern, and the purpose of this presentation is to describe the risk factors, signs and symptoms, and prevention methods for suicide.

Methods: Databases such as the American Foundation for Suicide Prevention and The Trevor Project provided statistical information on the prevention and effects of suicide. Keywords include “Suicide Across the United States” and “Suicide Prevention”

Results: Suicide is complex, with a variety of risk factors that contribute to the risk of suicide, including a history of mental disorders (particularly depression), history substance abuse, and barriers to accessing mental health treatment. Suicide can disproportionately affect some populations, such as veterans and LGBTQ youth, and understanding these differences can improve the way in which we intervene and assist these individuals. Additionally, understanding the signs and symptoms of suicidal ideation allow for early intervention. Briefly, signs and symptoms of suicide include, Talking about Suicide and Hopelessness, Mood, and Behaviors. Additional prevention methods include interpreting warning signs, encouragement, and reporting.

Discussion: Suicide is a significant public health concern that can have a significant impact on individuals, families, and communities. Although there are existing suicide prevention methods, there is a need for additional education in the general US population to understand the signs and symptoms of suicidal ideation and ways to intervene.

Henry S. Leavitt

*Bassoon Ensemble*

In preparation for IDRS 2021, we will be performing 1-2 bassoon ensemble pieces by student composers and arrangers from the Schwob School of music at Columbus State University.

Abigail L. Lloyd

*An Analysis of Street Art in Berlin, Germany, and Florence, Italy*

The subject of street art v. graffiti has been widely debated for many years. What is the difference between street art and graffiti? When does art cross the line into vandalism? What are the psychological effects of street art on passersby? These questions, and more, will be answered in this paper with a basis in fact and personal opinion. An Analysis of Street Art in Berlin,

Germany, and Florence, Italy, will not only address the questions previously posed, but it will also provide an in depth analysis of individual artists in each city, focusing on their style, intention, and placement. Modern artists specifically mentioned include Alias, XOOOOX, and Mein Lieber Prost of Berlin, Germany, and Carla Bru, Lediesis, Clet, Blub, and Exit/Enter of Florence, Italy. The goal of the paper is to illuminate the positives of street art, such as how it encourages freedom of expression, and to provide a historical analysis of the influences that lead to the differences of the art in the cities of Florence and Berlin, being: the High Italian Renaissance and the Cold War.

Marta Lopez

### *DACA*

This research project focuses on the immigration policy, Deferred Action for Childhood Arrivals commonly known as DACA. It explores the initial purpose, how it was passed, approved, and how it affects the “dreamers” who were brought to the United States as undocumented children. It also goes over the qualifying criterion and what the restrictions under this program are. In *DACA and the Supreme Court: How We Got to This Point, a Statistical Profile of Who Is Affected, and What the Future May Hold for DACA Beneficiaries* by Daniela Alulema, she proves how the program was put in a precarious situation when the Trump administration took over, “The rescission of the DACA program has produced stress and anguish among DACA recipients because they again face living in a legal limbo and an uncertain future (Alulema, 128).” The applicants who could every two years renew their work authorization, feared being deported on each renewal interview or getting their benefits revoked. She also shares how the program authorized millions to have access to better healthcare, education, and opportunities (Alulema, 129). DACA permitted college students to qualify for in-state tuition, which meant that it became somewhat affordable for families. In their 2014 research project, Yohualli Balderas-Medina Anaya, Mithi del Rosario, Lawrence “Hy” Doyle, and David E. Hayes-Bautista, cover the impact DACA had on college students. Specifically, on the ones who aspired to be doctors ( Anaya, Del Rosario, Doyle, Hayes-Bautista, 1600).



My research paper concludes exploring what the future holds for DACA recipients under the new presidential administration and how it will affect society in the United States.

Patrick J. MacDonald

*An Examination of the Propaganda of Donald Trump and Napoleon Bonaparte*

President Donald Trump's 2016 Presidential Campaign captivated the world and held a tight grip on social media for months leading up to the election. The President's social media usage was seen as completely novel, offensive, and unprofessional, but above all else, it was extremely effective. News outlets and prominent social media accounts seemed to be baffled by this approach, and only after his inauguration did they begin closely examining his methods and how effective they were. The academic community has done several studies on the content, reactions to said content, and strategies employed by President Trump in order to better understand his methods. This research compares the strategies of Trump with those used by Napoleon before he became Consul, where he worked tirelessly to improve his image and ingratiate himself into the everyday conversation of French citizens. In comparing the strategies of Trump and Napoleon as well as those of Jacques Louis-David and Daniel Scavino, their ambassadors of propaganda, comparable trends emerge, and we can observe the precedents set by Napoleon evolve into the modern techniques utilized by Trump. This research gives special attention to the memes curated by Daniel Scavino for President Trump's social media accounts. Defining what memes are, how they fit into political discourse, and the niche they fill in modern communication is crucial in understanding the success of the campaign. These memes are compared loosely to art produced by Jacques Louis-David for Napoleon's publicity campaigns, as they serve the same function despite the vast disparity of respect given to the respective media. In observing their similarities, the seemingly absurd methods of President Trump become more rational and calculated, while the two-hundred year old strategies used by Napoleon appear strikingly modern and understandable.

Korie E. MacDougall

*How Female Characters are Portrayed in Children's Television: An Analysis of Media's Role in Early Age Gender Socialization*

This research explores the role of female leads and supporting characters from children's television in gender socialization by analyzing their stereotypical (feminine) and non-stereotypical (masculine) traits and behaviors. The data examined the highest viewed children's television shows from the most recent cable ratings available as of the fall of 2019. Seventy-nine female characters were determined and evaluated throughout the episodes viewed during the time period they were rated. The paper includes observations about their occupation, color theme, outfit, age, and build. The number and type of non-stereotypical and stereotypical behaviors were also recorded. This data resulted in many findings - the most conclusive of which was that approximately seven percent of the female leads offered a "gender-balanced" perspective and experience to the viewer. In other words, these characters (of which there were two) exhibited a balanced amount of both non-stereotypical and stereotypical traits and behaviors. These results and other findings strongly suggest, not only are female characters lacking in diversity and are overall under-representative of their audience, but they still lack gender parity with their male counterparts in terms of their overall presence. This is significant because until children's media depicts "gender-balanced" female characters, persistent stereotypes will continue to mold gender socialization of the past into young minds of the future.

Tanya Miller, Dr. Brian Tyo & Dr. Kate Early

*Effects of Blood-flow Restriction Training: An Analysis of Baseline Group Differences*

Introduction: Blood-flow restriction training (BFR) is empirically supported as a safe and effective alternative to traditional resistance training for the purpose of muscle strength and hypertrophy in individuals who cannot access resistance training equipment or populations for whom heavy lifting is contraindicated. However, little data exists regarding the impact of BFR on cardiovascular/endothelial function. The purpose of this analysis is to examine the characteristics of a sample of subjects prior to BFR intervention and compare baseline group differences.

Subjects and Methods: Fifteen healthy adult office workers (ten females; 29-66 y; 24.6-51.3 kg/m<sup>2</sup>) from the community volunteered for this study. Subjects were below physical activity recommendations and performed a sedentary occupation. Subjects arrived fasted for baseline blood lipid/glucose measures, anthropometrics, cardiovascular, and muscular fitness testing. Subjects were randomized into control, reduced-sedentary-time, or BFR groups. Baseline characteristics were analyzed as an entire sample and by groups.

Results: Groups did not significantly differ at baseline in any measure, using an alpha <0.05.

Conclusion: Although a small sample size, randomization successfully produced relatively homogenous groups which is desirable for this area of research.

Jennifer K. Musgrove

#### *AI and Its Development In Fiction*

AI is a developing technology that raises many serious questions such as its ability to think far beyond human understanding and, if programmed to think as humans, what reactions should be expected from it even if those reactions are negative ones found in humans. With new AI programs appearing in the world such as Google Duplex, Siri, or Amazon's Echo, it is time that we start to consider the implications of technology that is taught to think and react in human ways. Fictional writings often leave us with many thoughts on what AI could look like in the future and what problems need to be discussed as the development for such technology rapidly continues. Looking at the book 2001: A Space Odyssey, we see a couple different problems arise such as computers and humans having different computing abilities and the assumption that an AI would be able to understand its superiority in that way and if teaching, treating, and programming an AI in a very human way could elicit human responses from it.

Shyrisse L. Ramos

#### *Chemical Investigations of Pasaquan and Interdisciplinary Paint Restoration*

It has been four years since the complete, multi-million-dollar restoration of Pasaquan, a 7-acre exterior art-site located in Buena Vista, GA. Since then, there have been a number of dramatic changes in the painted facade on the

outdoor structures, walls, and sculptural forms. The paint appears to be fading over time. A conservation group painted and prepared the paint for the complete restoration of Pasaquan, followed by a subsequent report describing their assessment with the issues surrounding the changes of the fading paint. However, the report was inconclusive, and the recommended solutions and assessments did not garner positive results. It is suspected that the art site's exposure to an outdoor environment, which includes sunlight, rain, and heat, was the cause of the paint's instability and lack of longevity. The amount of pigment, binder, and dispersion water were examined, in order to determine a mixture that could optimally withstand these environmental conditions. Chemical analyses, such as elemental analysis (EA), mass spectrometry (MS), X-ray fluorescence (XRF), and energy-dispersive X-ray spectroscopy-scanning electron microscopy (EDS-SEM) were conducted to examine the chemical structure of the current paints at Pasaquan, as well as the degree and form of degradation of the aged paints. Qualitative and quantitative tests were designed to determine the chemical basis for the color changes within the pigments, as well as assist in providing short- and long-term solutions for the exterior exhibition.

Jordan M. Slonaker, Trevon Harris & Nicholas Smith

### *Artificial Intelligence Application In Ranking Projections*

Artificial intelligence is a rapidly expanding field with ever growing applications. To demonstrate the breadth of this field our group chose to apply our understanding of artificial intelligence concepts to one of the top selling games to date, Starcraft 2. In our development we utilized artificial neural networks in an attempt to calculate players' in-game skill level based on several factors such as: age, actions-per-minute, total time played, time played per week and much more.

Kyla M. Sumter & Amanda Boyer

### *Mask or No Mask*

Background: To slow the spread of COVID-19, the CDC recommends wearing a face covering and physical distancing ( $\geq 6$ -ft from others). The objective of this study was to examine why individuals may or may not wear masks and how trust and fear of mistrust influence mask wearing.

Methods: This cross-sectional study e-mailed a survey on mask wearing to individuals at Columbus State University. These data were analyzed qualitatively by coding responses and grouping them into categories that best reflect patterns emerging from the data. Ordinal logistic regression predicting participants' belief of masks preventing the spread of COVID-19 will be presented at Tower Day.

Results: Participants were primarily white (54%) and 29.7 (SD=13.2) years old. Preliminary data indicates that individuals who maintained a 6-ft distance wanted to "stay safe and prevent the spread of the virus" (30%), whereas those who did not reported they "were family and did not feel it was necessary to social distance since they try to minimize exposure" (14%). For students with a roommate, those who maintained a 6-ft distance did so to "be respectful of each other and to stay safe" (23%), while those who did not reported that "it is unrealistic, because they live in such close proximity that if one of them got COVID that they would also get it" (33%).

Conclusions: Understanding the reasons for why individuals abide by public health safety measures is important in the implementation and acceptance of public health guidelines, particularly as personal beliefs may influence behavior.

Michelle D. Tucker

*Assessing toxicity in urban and rural streams in the Chattahoochee Valley (GA) using a lettuce seed germination bioassay (Lactuca sativa L.)*

Humans and the ecosystems on which they depend require access to clean freshwater, however, human activities generally tend to degrade water quality. Streams can be contaminated by our use of toxic chemicals (e.g., pesticides and herbicides). Because these pollutants are typically in very low concentrations and require specialized and expensive techniques to measure, they are often omitted from standard stream water quality assessments. To ensure the health of our streams and our citizens who live and recreate in them, I conducted a study to compare the toxicity of water collected in urban and rural streams in the Chattahoochee Valley area of Georgia. I hypothesized that there would be a greater level of toxicity in urban streams than rural streams. This question was answered by comparing the effect of water

samples collected from 9 urban and 9 rural streams on the germination/root growth of lettuce seeds (*Latuca sativa*). After a 12-day germination period, the root growth of the seeds treated with stream water from Columbus, Georgia (urban) and Harris County, Georgia (rural) respectively were analyzed against that of a distilled water control. While the causes of chemical toxicity in streams could not be determined by means of this bioassay alone, both urban and rural streams exhibited signs of chemical toxicity based on reduced root growth relative to the control. However, statistical comparisons of germination rates and growth rates showed that there is, in fact, no significant difference in toxicity between urban and rural streams. This result is an indicator that the impacts of humans on streams extends beyond the urban footprint of Columbus, Georgia. This study suggests that future water quality analyses should place equal importance on rural streams and urban to gain a more complete picture of the human impact on the Chattahoochee River area as a whole.

Morgan E. Wilson

### *Replicating a Study that Tests Shooting Bias*

This research project was originally a class assignment for PSYC 3211 Research Methods and Data Analysis I in fall 2019. The goal of the project was to replicate a study by Correll, Park, Judd, and Wittenbrink (2002) that showed subjects hold a shooting bias, in which targets are differentially shot at depending on their race/ethnicity. With the use of a video game simulation, we were able to test the effect that ethnicity/race has on the decision to shoot a target. The study used point payoffs to mimic the shooting decisions made by police officers while on-duty, and the payoffs differed based on the consequence of the decision. In the computer game, Black/African American and White/European American targets held objects that were deemed either harmless and subjects were instructed not to shoot those targets or deemed dangerous and subjects were instructed to shoot these targets before they shot you. In our class sample, we replicated the results of the previous study, which showed that the participants made the decision to shoot armed Black/African American targets faster than armed White/European targets, and not shoot unarmed White/European American targets faster than Black/African American targets (Correll et. al., 2002). Our hypothesis stated that racial biases would be present in Black/African American targets and that

these biases will affect the participants' shooting decisions. The hypothesis was partially supported by the results. This finding is interesting and also a cause for concern because, despite the small sample size, we showed participants still show more biases against Black/African Americans than White/European Americans.