17th Annual Carolyn & Norwood Thomas

Undergraduate Research and Creativity Expo

April 6, 2023

UNC GREENSBORO

Undergraduate Research, Scholarship *and* Creativity Office

17th Annual Carolyn and Norwood Thomas Undergraduate Research and Creativity Expo

2023

UNC GREENSBORO

Undergraduate
Research, Scholarship
and Creativity Office

a unit within the
University Teaching & Learning Commons

UNC GREENSBORO

Undergraduate Research, Scholarship *and* Creativity Office

utlc.uncg.edu/ursco

Preston Lee Phillips Jr., Ph.D.

Director

Traci Miller, MSA

MARC Program: Academic Enhancement Coordinator

Vrinda Prabhakaram Ganti

Graduate Assistant

Fatuma Tuider

Undergraduate Assistant

URSCO is a unit within the University Teaching and Learning Commons

Undergraduate Research, Scholarship and Creativity Office
~ Leadership Committee ~

Lee Phillips, Ph.D.

URSCO Director

Erick Byrd, Ph.D.

Bryan School of Business and Economics

Amy Adamson, Ph.D.

College of Arts and Sciences

Andy Hudson, D.M.A.

College of Visual and Performing Arts

Beverly Faircloth, Ph.D. and Jamie Schissel, Ph.D.

School of Education

Joi Bulls, Ph.D.

School of Health and Human Sciences

Laurie Kennedy-Malone, Ph.D.

School of Nursing

Angela Bolte, Ph.D.

Lloyd International Honors College

George R. Still III

Student Affairs

Kathelene McCarty Smith

University Libraries

UNC GREENSBORO
Undergraduate Research, Scholarship *and* Creativity Office
University Teaching and Learning Commons
130 Shaw Hall
Greensboro, NC 27402-6170
336.334.4776

April 6, 2023

Dear Students, Colleagues, and Guests,

I would like to welcome you to the *17th Annual Carolyn and Norwood Thomas Undergraduate Research and Creativity Expo*. We are pleased to include 160 presentations by more than 192 students, working with91 mentors, and representing 27 academic departments/programs.

The ***Undergraduate Research, Scholarship and Creativity Office*** (**URSCO**) is dedicated to promoting andsupporting student success through mentored undergraduate research, creative inquiry, and other scholarly experiences for the UNCG community. The URSCO is also dedicated to helping faculty become increasingly effective with mentoring undergraduate research and integrating research skills into courses and curricula. These experiences can occur in many ways, including co- or extracurricular projects involving one or more students mentored by UNCG faculty. Scholarship is achieved by using the tools of an academic discipline to answer questions that enhance knowledge and understanding. We seek to highlight the diversity of disciplinary scholarship for and through our students in order to help cultivate a culture of life-long curiosity and learning.

The URSCO offers financial assistance to promote faculty-mentored student scholarship and creativity. This academic year, we have provided ***travel assistance*** to more than 20 students to present the results of their inquiry at local, regional, and national meetings. We have also provided support for 50 students through ***Undergraduate Research and Creativity Awards (URCA)***, of which 2 were part of the ***Community Based URCA*** program. Finally, 5 students participated in the ***Artists inResidence*** program, in partnership with the *Lloyd International Honors College* and the *College of Visualand Performing Arts*.

Today is a day to celebrate your scholarly accomplishments. I would like to thank all students and their faculty mentors for taking the time to share your work with the university community. Many thanks go tothe Associate Vice Provost of the University Teaching and Learning Commons, Dr. David Teachout, ViceChancellor for Research and Economic Development, Dr. Terri Shelton, as well as Provost Debbie Storrs, and Chancellor Franklin Gilliam for their unwavering support of the office and their dedication to student success. As always, special thanks go to Mrs. Carolyn Thomas for her generous contributions in support of the Expo and faculty-mentored undergraduate research. I would also like to thank Traci Miller, Katherine Reese, Vrinda Ganti, and Fatuma Tuider for their efforts to ensure the success of today's program. Finally, I thank Ms. Adrienne Middlebrooks for her years of dedication to UNCG through the URSCO and wish her all the best in retirement.

Sincerely,

Lee Phillips, Ph.D.
Director, URSCO

UNC GREENSBORO
Undergraduate Research, Scholarship *and* Creativity Office

16TH ANNUAL CAROLYN AND NORWOOD THOMAS UNDERGRADUATE RESEARCH & CREATIVITY EXPO

TABLE OF CONTENTS

About Carolyn and Norwood Thomas 1

2023 Thomas Undergraduate Research Mentor Awards: 2

Abstracts

Alphabetically by Student Last Name 6

NC Docks 75

Book Information 76

CAROLYN AND NORWOOD THOMAS

Carolyn Styron Thomas graduated from Woman's College, now UNCG, in 1954 with a bachelor's degree in business. She is very committed to the success of her alma mater and believes strongly in the value of education. "The experience of obtaining my college degree at Woman's College gave me confidence throughout my life to face challenges, raise my family and serve my church and community, all leading to a very rewarding life," says Mrs. Thomas. To express their appreciation for Carolyn's education, the Thomases established an endowed fund in 1996 to support undergraduate and faculty research.

Mrs. Thomas has served on the board of directors for the UNCG Alumni Association and, most recently, the UNCG Board of Visitors. She is a member of the Harriet Elliott Society at UNCG. She has also been involved in numerous organizations in her hometown of Durham, NC, including the Junior League, the United Arts Council and the Methodist Retirement Home.

Her husband, the late Norwood A. Thomas, Jr., graduated from Duke University in 1955. The Thomases dated in college and were married for 46 years. Mr. Thomas retired from his position as Executive Vice President at Central Carolina Bank after 37 years. He later was a founding partner of the investment firm of Wilbanks, Smith & Thomas Asset Management of Norfolk, Virginia, where he worked for more than 10 years. Mr. Thomas was very active in community affairs in the Thomas' hometown of Durham.

2023 Thomas Undergraduate Research Mentor Award

Tenured track: Dr. Kimberly Petersen, Department of Chemistry

Since joining UNCG 12 years ago, she has mentored 35 undergraduates in her research group, which focuses on developing new ways to synthesize molecules.

Eight of her students have been published as undergraduates, two received travel awards from the American Chemical Society, and, in just the past five years, 25 have presented their research at conferences, with some even winning awards for those presentations. In 2021, one of her mentees received the prestigious Goldwater Scholarship.

"When you mentor undergraduate students, you get to spend a lot of time with them one on one, and you really get to know them and see them grow as a scientist and as a person," she says. "You can see the change that has happened in their confidence and in their abilities. And it's just really an amazing experience."

Students have gone on from Petersen's lab to highly ranked graduate programs, medical school, and successful careers with major biotech companies. Two of her students received prestigious NSF graduate fellowships for their graduate studies. "Now at Caltech, I am so grateful to have had a PI that built up my self-confidence," shares one of her former mentees. "There are multiple examples where Dr. Petersen helped me grow past imposter syndrome. She saw potential that I didn't see in myself."

Petersen says, "I try to make our research group very supportive. Everybody is cheering for everyone else. We really try to build each other up." Petersen, who identifies connection, inclusion, opportunity, and engagement as essential to teaching and mentoring, is particularly committed to recruiting students from groups historically excluded from her field. "It brings new experiences to the table and new mindsets and new ideas."

As part of her commitment to diversity, equity, and inclusion, she serves as co-PI on two NIH-funded and NSF-funded programs at UNCG that aim to support students from underrepresented groups in science.

"Having these opportunities exposes students – who traditionally haven't been

2023 Thomas Undergraduate Research Mentor Award

welcomed into STEM – to something that maybe they didn't know they would be passionate about," she says. "Then they take it and run with it and go in a million different directions." Petersen received UNCG's Alumni Teaching Excellence Award in 2018, as well as her college's teaching award the previous year, and she has previously held UNCG's Candice Bernard and Robert Clickman Dean's Fellowship. One of her prized possessions is a mug gifted to her by her students that reads: You're not only the best chemistry teacher, but also the best father. "My students tell me that I'm kind of like that awkward dad with the jokes and whatnot." When asked about her experiences as a mentor, she says, "I'm moved by the stories my students tell me after they leave. I've had students get back in touch with me and say, 'I thought we had something special at UNCG, but when I've gone elsewhere, I can really see how special that time was.'"

2023 Thomas Undergraduate Research Mentor Award

Pre-tenure track: Dr. Brittany Cassidy, Department of Psychology

Since joining UNCG five years ago, Cassidy has mentored 30 undergraduates in her Social Cognition Lab, which focuses on how people think, interpret, and evaluate each other.

"Participating in research as an undergraduate has enormous benefits," she says. "I know from firsthand experience that being in a lab and doing research as an undergraduate was the most impactful part of being in college for me, and it affected my entire career trajectory. I would not have been able to reach the position that I am today without the mentors that I had."

In Cassidy's time at UNCG, already her mentees have been part of eight conference talks and presentations, and two students are co-authors on manuscripts currently under review.

Her area of interest offers students a wide range of opportunities, many unavailable at other universities. Students gain experience in everything from recruiting participants and running behavioral and neuroscience tests to working with the JSNN's MRI for functional neuroimaging research.

"These are opportunities that don't happen at every university and a strength of UNCG," says Cassidy. "Students get to really see what's going on versus just learning about the methods in the classroom, and that can be really, really eye opening."

She enjoys seeing students moving out of their comfort zones. "It's really rich for me to see undergraduates succeed and learn and become much more confident in their abilities, whether it's writing or speaking, or even just becoming more well versed in the literature."

A personal favorite memory, she says, is when a student who had never been out of state or on an airplane traveled with her to San Francisco to present at the national conference of the Society for Personality and Social Psychology.

Several of Cassidy's mentees have entered prestigious graduate programs in areas ranging from industrial organizational psychology to social work, to cognitive neuroscience. Others have entered the workforce in research-related positions.

2023 Thomas Undergraduate Research Mentor Award

“Even if they don't become social psychologists, you can see them using the skills that they learned to be successful outside of the lab. It brings them confidence, I think when they're looking for careers.”

Cassidy says her philosophy is to treat undergraduate researchers like they are on the same level as she is. “It helps undergraduates grow in their confidence to have discussions and take ownership of their research,” she says.

“They really drive the research forward, and it helps me really have a holistic view of being a professor. I like that UNCG is a place where your identities as a researcher and as a teacher and mentor are similarly valued. It's a place where I've been able to grow and learn from a diversity of students, as much as I teach them.”

ABSTRACTS

Effects of Low-level expressions of lipoic acid on mitochondria-related genes in interscapular brown adipose tissue (iBAT) of mice

Student Author(s): Shafaq Ahmed, Senior (Biology), Mohammad Iqbal (Biology), Faiza Ali (Biology)
Faculty Mentor(s): Dr. Zhenquan Jia (Biology), UNCG; Dr. Xianwen Yi (UNC- Chapel Hill).

Lipoic acid plays a part in the cellular respiration process by acting as a cofactor for pyruvate dehydrogenase when converting pyruvate to acetyl CoA for the citric acid cycle. This process occurs in the mitochondria and is essential to the adequate production of ATP for the human body. *Lipoic Acid* Synthetase (Lias) is the *enzyme involved in the endogenous synthesis of lipoic acid*. However, it is unclear whether the attenuation of Lias gene affects the expression of genes related to mitochondrial biogenesis and mitochondrial function, including mitochondrial uncoupling protein 1 (UCP1), PR domain containing 16 (PRDM16), peroxidation Peroxisome proliferator-activated receptor g (PPARG) and peroxisome proliferator-activated receptor-gamma coactivator (PGC1alpha). *Lias$^{L/L}$mice with* Low-level expression of Lias *were created via* modifying the 3'-untranslated regions (3'-UTR) of the *Lias* gene. The Lias gene expression in *Lias$^{L/L}$mice is only* 10% of wild-type mice. interscapular brown adipose tissue (iBAT) was collected from *Lias$^{L/L}$mice and* wild-type mice. The real-time PCR results show that the gene expression of UCP1, PRDM16, PPARG, and PGC1alpha was significantly reduced in *Lias$^{L/L}$mice* compared with wild-type mice suggesting a crucial role of Lias in regulation of mitochondria-related genes.

The effect of carbon nanodots on TNF-alpha-induced inflammation in C57BL/6 mice heart tissues

Student Author(s): Shafaq Ahmed, Senior (Biology)
Faculty Mentor(s): Zhenquan Jia (Biology)

Atherosclerosis is the hardening of blood vessels and is a main cause of cardiovascular disease, which affects many people around the world. Atherosclerosis is strongly regulated by various pro-inflammatory molecules, such as macrophage chemoattractant protein-1 (MCP-1), interleukin 1 beta (IL-1 beta), and interleukin 6 (IL-6). The heart is pertinent to studying viable treatments as the ability to pump blood to the body is jeopardized in cases of atherosclerosis. A new class of nanoparticles, called Carbon Nanodots (CNDs), has been noted as promising for bioimaging, biosensing, and drug delivery. However, there is not much research on the effects of CNDs on inflammation in the heart. In this study, I studied the impact of CNDs on TNF-alpha-mediated expressions of pro-inflammatory genes in mouse heart tissues. C57BL/6 mice tissues have been treated with either TNF-alpha (25 μg/kg bw), CNDs (2.5 mg/kg bw CNDs), both TNF-alpha and CNDs, or neither to serve as the control. The real-time PCR performed shows that the CNDs decreased the expression of MCP-1, IL-1 beta, and IL-6 beta and increased the expression of GCLM and NQO1. Our results suggest that CNDs can potentially combat TNF-α-induced cardiac inflammatory responses.

True Crime Researched Abstract
Student Author(s): Barbara Allen
Faculty Mentor(s): Sara Little John

When it comes to the psychology of the brain, the development of serial killers' brains compared to the normal human brain deals with not only the environment they grow up in but with how the left and right brains develop. Before my research, I will do a survey to get people's opinions on true crime and what they feel "made" serial killers kill. In my paper, that I also had in my paper, I will talk about the level of activation in the brain of a normal person compared to a murders' brain. Additionally, I will talk about how child abuse affected their childhood, and they believe letting out their aggression and killing people is the only solution to their problem. In one source called "Myth of the Chosen One: The Psychology of Serial Killers", they talk about one serial killer named Javed Iqbal and how his parents affected him during his childhood. I will conclude my research with a psychoanalytical perspective on the aggression of serial killers and the concept of evil. In the article, "Sexually motivated serial killers and the psychology of aggression and "evil" within a contemporary psychoanalytical perspective", I will go into talking about human history as well as the principles of aggression and aggression as a drive.

The Impact of heavy sources of nutrients on ant populations in the Longleaf Pine Ecosystem
Student Author(s): Gabriell Allred (Biology)
Faculty Mentor(s): Sally Koerner (Biology)

Ants are important members of many ecosystems across the world. They benefit their ecosystem in many ways including, making it easier for new plants to sprout roots, removing dead or dying organic material, and the spreading of seeds. Therefore, it is important that ant populations are protected and considered when looking at the overall health of an ecosystem. Data was collected from plots used by the Koerner lab which had already spread a variety of nutrients around in specific plots, while keeping some plots as controls with no outside influence. We collected insects from each plot using sweep nets and a vacuum of sorts. I then found the number of ants collected from each plot. The data showed that there was
Ants play an important role in ecosystems around the world. They perform ecosystem services such as aiding in nutrient acquisition, herbivory, soil management and decomposition. As such, ant location and performance could indicate the health of the ecosystem where they reside. The longleaf pine ecosystem (LLP ecosystem)… (talk about the LLP system and why it's important). Ants contribute significantly to the arthropod population in LLP systems. (Sentence or 2 talking about where ants tend to set up colonies(cite)). This project aimed to follow the movement and reaction of ant populations in the long leaf pine ecosystem when heavy sources of nutrients like potassium and nitrogen are available in the soil. Will the ants follow these sources or will they remain widely spread out? We hypothesize that ant colony location will predict nutrient abundance and spread.
In the LLP ecosystem in the Sandhill Gamelands, arthropods were collected using SweepNet and D-vac methods in all 30 plots. Ant populations were identified and tracked across these plots. Preliminary data suggests a relatively strong relationship inessential nutrient location compared to local ant population. This could be important for future studies in the field of restoration. Ants

are important parts of their ecosystems so it must be considered what impacts restoration efforts have on ants whether they be positive or negative. This data can help with determining this.

Exploring Public Health Education students' perspectives on the college experience and on integrating research training into their studies
Student Author(s): Callie Annas (Public Health Education), Tamaya Long (Public Health Education), Albar Arvizu Contreras (Public Health Education and Promotion)
Faculty Mentor(s): Michelle Martin Romero (Public Health Education), Sandra Echeverria (Public Health Education), Sharon Morrison (Public Health Education)

The college experience offers many choices for majors and for co-curricular activities on campus. For example, students' participation in research enhances learning and promotes marketable skills for future careers. For the Public Health Education (PHE) students, a research experience offers exposure to "real time" community problems and builds competencies for professional practice. The purpose of this study is to explore undergraduate students' 1) perceptions about college experiences and 2) interests in public health research training. Five focus groups will be conducted (25 participants total) with Public Health Education students. Three of the focus groups will be with students in the community health education concentration and two will be with students in the health studies online concentration. Focus group transcripts will be thematically analyzed with attention to similarities between, and distinctiveness across participant responses. We anticipate students' college experiences will vary but they will have favorable attitudes towards integrating research training in their plan of study. Study findings will aid faculty in developing an undergraduate research initiative for enhanced student engagement in public health education.

Color Theory: Your White Children
Student Author(s): Quan Apollo, Senior (Art)
Faculty Mentor(s): Christopher Thomas (Art)

A selected work of art, *Your White Children*, of the *Color Theory* series covering the broad and prevalent issue of racism and subsequent issues of colorism in the United States particularly within the African and Asian-American communities uses the home as a basis of the study. A family of African American and Vietnamese descent is displayed to critique the notion of recognizable phenotypes and their relation to perception and identity from the viewpoint of mother to child. Using highly abstracted space and caricatures to the more representational elements employed with photographs contemplating its rich history of being considered to capture what is 'real'. The dynamism between the abstracted children surrounded by the juxtaposed reality of verbiage used to define their character and heritage with the mother, who is directly represented, sitting as the head of the dinner table looking not only at her children but words defining them creates the tone and the tension between elements and ideas. Ideas of racism, culture, stereotypes, and the ability or inability to express oneself in a setting commonly considered to allow such.

Expression of *Pyrococcus furiosus thioredoxin* (PfTrx) in transgenic tobacco for enhanced abiotic stress tolerance

Student Author(s): Daniel Araya, Junior (Biology)
Faculty Mentor(s): Osena Ayalew (Biology)

Plants are essential to human survival. Every single thing we consume comes from either plants or animals which depend on plants at some point in the food chain. A third of the carbon dioxide that humans emit each year is absorbed by plants, which are also the foundation of natural ecosystems. Unfortunately, with climate change stressors that weaken plant growth and productivity will occur. Abiotic stresses such as rising temperature, droughts and salinity are common manifestations of climate change. Climate change has had a number of negative consequences on the biosphere's plant population. Abiotic stresses induce oxidative stress in plants. Plant cells have an antioxidant system, which is the protective mechanism of the cell that protects plants against stressors. However, under extreme conditions, plants may be unable to combat reactive oxygen species that induce oxidative stress. In this study, we are interested in *Pyrococcus furiosus*, which is an archaea whose optimum temperature is 100°C, which is a temperature that would kill most living things. Which means it has the ability to thrive above the boiling point of water. In my research, I am testing whether the *P. furiosus* thioredoxin gene (*PfTrx*) confers stress tolerance in transgenic tobacco plants. Thioredoxins are redox proteins present in all organisms and hold significance in biological processes. The Osena lab previously generated transgenic tobacco expressing the PfTrx genes. Our preliminary data show that the transgenic lines are more tolerant to salt and drought than the non-transgenic control plants. I will perform phenotypic, biomedical, and molecular characterization of the transgenic tobacco lines under abiotic stress conditions. We expect to identify stress tolerance genes from archaea that can be transferred to economically important crops such as rice and cassava.

How skin tone satisfaction relates to discrimination, racial-ethnic pride, and depression in Latinx Youth.

Student Author(s): Karen Ascencio-Villatoro, Senior (Psychology)
Faculty Mentor(s): Gabriela Livas Stein (Psychology)

New work is emerging that seeks to uncover how colorism (or differential treatment due to skin tone) impacts the health and well-being of Latinx youth. Skin tone satisfaction (STS) may provide a unique window to understanding how Latinx youth feel about who they are, but few studies have looked at the correlation between STS and racial-ethnic discrimination, racial-ethnic pride, and depression. Dissecting the relation between each construct and STS can provide additional insight into the risk and resilience factors associated with colorism. In terms of risk, I hypothesize that racial-ethnic discrimination will be associated with lower STS, and lower STS will be associated with depression. For protective factors, I predict that ethnic-racial pride will be associated with greater STS. This study included 175 Latinx adolescents (primarily from Mexico and Central America; mean age = 12.87 years of age) who completed self-report measures. Preliminary analyses suggest that skin tone satisfaction has a negative correlation with discrimination and depression and a positive correlation with racial-ethnic pride. These results suggest that skin color satisfaction has a significant impact on Latinx families' well-being and racial pride that should be further examined in the near future.

Sophoclean Heroes: A Case for Deianeira and Heracles
Student Author(s): Cecil Barlow, Sophomore (Classical Studies)
Faculty Mentor(s): Michiel Van Veldhuizen (Classical Studies)

This presentation and research project studies the relationship between the main characters of Sophocles' "Women of Trachis", and Bernard Knox's outline of a Sophoclean hero. Knox, in his theory outlining works which contain a Sophoclean hero, states that the "exception [to this theory] is, of course, The Trachiniae". I argue that this belief is outdated and incorrect, and is rooted in an interpretation of The Trachiniae that does not consider the implications and importance of gender in The Trachiniae. As well, I would argue that this statement is incorrect due to the scale and setting of The Trachiniae, as the work is about the Oikos (the Greek homestead), while the rest of the works of Sophocles that establish this rule are about kingdoms and war. To explore and argue this point, this presentation will heavily analyze Greek gender roles and how they are used and inverted in The Trachniae.

Possibilities: How artists make their own opportunities
Student Author(s): Bjorn Bates, Senior (Art), Ella Coyne, Senior (Art)
Faculty Mentor(s): Pat Wasserboehr (Art)

"Possibilities" is a show about testing and expanding the boundaries of what we are capable of as developing artists. In 2022 were granted a two-week artist residency at Salem Art Works in Salem, NY by the UNCG Sculpture Faculty. The opportunity was an inspiring learning experience for both of us, and when we returned to Greensboro it became the basis of a gallery exhibition at UNCG, showcasing all the work we accomplished. We are receiving a traveling grant to bring the show back to New York where the idea was conceived. As artists, we have to be the catalyst for making our careers develop; by building on the trust and resources invested in us we can open up new possibilities.

The Study of Organic Synthetic Techniques for Novel Syntheses of Drug Targets
Student Author(s): Logan Brown, Senior (Biochemistry), Emily Ramirez, Senior (Chemistry)
Faculty Mentor(s): Dr. Mitchell Croatt (Chemistry)

Organic synthesis is the practice of reacting simple, small molecules to form more complex, large molecules. The final targets of organic synthesis are often of medicinal, material, or other uses. Often, syntheses are run according to known procedures that are already published, but with unpublished starting materials. To discover new techniques our knowledge on organic chemical synthesis must continue to expand. The Claisen rearrangement is an isomerization reaction. This means that the starting material does not gain or lose any atoms, but instead, the order in which the atoms are connected changes. This can be compared to changing a LEGO creation. We move LEGO blocks around, but we're not adding or removing any of them. For the Claisen rearrangement, a critical part of it is that it forms a new carbon-carbon bond. In our substrate, the new bond is formed in a position that is more crowded, which is unexpected. The goal of our project is to test different sized migratory groups and observe their effects on the preference to migrate to one position on the ring over the other.

Social Work in a Dilemma
Student Author(s): Shabree Brown, Sophomore (Social Work)
Faculty Mentor(s): John Sopper (Residential College)

As a professional field, Social Work often attracts people, at least initially, because of the opportunities it provides to help others. But it is also a profession that many avoid due to the common perception that social workers' pay is exceptionally low. Therefore, a significant question is, what factors determine the pay scale for social workers? To answer this question, I consulted many sources such as the U.S Bureau of Labor Statistics, Career Outlook, and the National Association of Social Workers. Through my research, I discovered that many factors determine the pay scale of social workers, including the individual social worker's level of education, field of specialization, location, gender, and race. This information is important as the world constantly has an increasing demand for social workers and it is necessary to acknowledge what may be preventing more people from entering the profession.

Moving the Gods: The Relocation of the Altar of Zeus Agoraios
Student Author(s): Keagen Buckley, Sophomore (Classical Studies), Cecil Barlow, Sophomore (Classical Studies), Rebecca Snyder, Freshman (Music), Rebecca Skebeck (Archaeology)
Faculty Mentor(s): Joanne Murphy (Classical Studies)

Our presentation examines the reasons and motivations behind the relocation of the Altar of Zeus Agoraios in Athens, Greece from the Pnyx to the Agora. This Altar, dedicated to Zeus "of the gathering" was constructed on the Pnyx, the gathering place of the assembly, during the 4th century BC. With significant investment of resources was relocated during the Augustan period of the Roman occupation of Greece in the 1st century AD to the Agora, the democratic and legal center. We argue that the Altar was moved in accordance with Augustus' plans to undermine large democratic gatherings and that he was consciously eradicating the power of the Pynx as a place of democratic focus. To illustrate our point, we discuss the evidence for the construction of the Altar and for its move; the socio-political importance of both locations to the power of Athenian democracy; and other examples of Augustus actively taking power from democratic institutions.

Addressing Common Challenges Within the Cardiovascular Systems
Student Author(s): Alexa Camatcho, Sophomore (Business Administration)
Faculty Mentor(s): Sara Littlejohn (Residential College)

Congenital Heart Disease is the most common birth defeat in the world. In early 2020, they confirmed the 8th FDA-approved device to treat the heart. With one of the most common diseases in world why is there only 8 devices? As you read, you will learn the process of each device and how it affects the heart. Congenital heart disease approximately affects 2-3 million people in the United States my family included. After my brother was born, our family's lives changed forever. My parents were told his first diagnosis at just a few months old, with Hypoplastic Left Heart Syndrome. I argue the common misconceptions of Congenital Heart Disease being "curable" with certain medical devices in the healthcare industry. As you read, you will become familiar with local families including my own, who are a part of local heart

foundations. I look closer in the Cardiovascular medical device industry and become more familiar with the economics using scholarly journals like Andreas Kirisits *"The Economic Evaluation of Medical Devices: Challenges Ahead."* who go into depth into the healthcare system and develop solutions for common health challenges. I hope my readers walk away with a better understanding of Congenital Heart Disease as well as a new perspective of current medical devices.

Restaging Contemporary Dance on Male Bodies Using LMA and Motif Notat
Student Author(s): Jonah Carrel, Senior (Dance)
Faculty Mentor(s): Teresa Heiland (Dance)

Using concepts from Motif Notation and Laban Movement Analysis (LMA) I am restaging a contemporary dance piece choreographed for two women by Dr. Teresa Heiland and Krissie Marty on two male identifying dancers. Utilizing Motif Notation and LMA, both of which are systems used by dancers to notate movement on paper, requires practice and physical application in rehearsal spaces. In this project I have been presented with fully notated scores of an eight-minute piece entitled *Calgon* by Dr. Heiland and have been working with a peer in the dance department to restage the work. Through this process I am not only investigating ways in which I can become proficient in reading LMA and Motif Notation, but Heiland has invited me to create a supplementary score by making changes to the score that reflect the movement being placed on two bodies of a different gender, something that has yet to be done with this piece. Just as well, the project is presenting me with ways in which I can communicate LMA and Motif ideas to a partner who as of now is not literate in these systems. By the end of this study I will have a fully reconstructed piece that I will showcase in the UNCG Spring Dances concert.

Carbon nanodots attenuate lipid peroxidation in the brain cortex of LDL receptor knockout mice
Student Author(s): Jinlan Chen, Post-Bacc (Chemistry), Delicia Esther Cardenas Vasquez, Post-Bacc
Faculty Mentor(s): Zhenquan Jia (Biology), Keith Erikson (Nutrition), Steve Fordahl (Nutrition)

Abnormal cholesterol metabolism can lead to oxidative stress in the brain. Low-density lipoprotein receptor (LDLr) knockout mice (LDLr-knockout mice) are models for studying altered cholesterol metabolism and oxidative stress in the onset of the brain. Carbon nanodots (CNDs) are a new class of carbon nanomaterials below 10nm and have strong fluorescence. CNDs have antioxidant properties and are applied in bioimaging, biosensors, and drug delivery. However, the effect of CNDs on brain lipid peroxidation in LDLr knockout mice remains to be investigated. In this study, we examined the impact of CNDs on lipid peroxidation in the mouse brain cortex using the Thiobarbituric Acid Reactive Substances (TBARS) assay. TBARS assay is widely used to measure lipid peroxidation in biological samples. LDLr-deficient mice and Normal C57BL/6 mice were treated with 0, or 2.5 mg/kg bw of CNDs for a 16-week period. The brain cortex tissues were removed and analyzed for lipid peroxidation using the TBARS assay. In C57BL/6 mice, lipid peroxidation levels of the brain cortex did not change significantly between control and CNDs treatment, indicating the safety of CNDs in terms of oxidative stress. However, lipid peroxidation levels were significantly increased in untreated

LDLr-knockout mice compared with untreated C57BL/6 mice, suggesting that altered cholesterol metabolism produces oxidative damage in the brain cortex. However, LDLr-knockout mice treated with CNDs showed a significant decrease compared to the untreated LDLr-knockout animals, indicating the anti-oxidative stress properties of CNDs. Our results will help researchers to understand the safety of CNDs and explore the potential application of this nanomaterial combating the harmful effects caused by lipid peroxidation.

Inhibitory control and the development of internalizing and externalizing behaviors within the context of perceived victimization
Student Author(s): Camryn Chepes, Junior (Psychology), Sabine Huber, Post-Bacc (Psychology)
Faculty Mentor(s): Susan Keane (Psychology)

Previous literature has documented associations between inhibitory control and the development of maladaptive outcomes, including internalizing and externalizing behaviors over time. Further, evidence suggests that contextual factors, such as peer contexts, may exacerbate the relationship between inhibitory control and internalizing and externalizing symptoms. While previous literature has well-tested pathways to externalizing and internalizing symptoms, less is known regarding the impact of high and low inhibitory control on childrens' development of internalizing versus externalizing behaviors in the context of perceived peer victimization. The present study aims to test whether high and low levels of inhibitory control, assessed at age 10 using a lab-based executive functioning task, predicts the development of internalizing versus externalizing behaviors. Internalizing and externalizing behaviors will be assessed by self and parent report questionnaires at age 15, within the context of perceived peer victimization, which is assessed using self-report questionnaires at age 10. We predict that, in the context of peer victimization, children with high levels of inhibitory control will cope by engaging in behavioral 'over control' characterized by withdrawal and avoidance, leading to increased internalizing symptoms. We also predict that the regulatory resources of children with low inhibitory control will become overtaxed by peer victimization, resulting in increased deployment of subdominant responses, including aggression/other externalizing behaviors.

Ancestral BPA Exposure Effects to Reproductive Health: Follicular Atresia in the Medaka Ovary
Student Author(s): Donajah Cherry, Senior (Biology)
Faculty Mentor(s): Ramji Bhandari (Biology)

Bisphenol A (BPA), a ubiquitous chemical contaminant, can promote multitudes of endocrine-disrupting reproductive health effects. Direct BPA exposure can disrupt reproductive processes such as oocyte differentiation and promote follicular atresia in the ovary. It is not clearly understood if ancestral BPA exposure can cause ovarian disruption several generations after the exposure to BPA. In this project we observe the ovary of the medaka (Oryzias latipes) fish whose great great grandparents were exposed to an environmentally relevant concentration of BPA (10 ug/L) during their first 12 days of embryonic life to determine the effects of BPA. The quantitative and qualitative histomorphological changes were determined. We found that ancestral BPA exposure disrupted the progression of oocyte and follicular stages. BPA lineage females had a significantly higher number of previtellogenic oocytes with big atretic follicles.

Interestingly, the BPA lineage fish had transgenerational non-alcoholic fatty liver disease (NAFLD) and the liver transcriptome showed tremendous upregulation of vitellogenin and ESR genes due to ancestral exposure. Continuing studies on reproductive processes affected by BPA in the future would further help in understanding the mechanism for the inheritance of ancestrally exposed follicular atresia as well as ancestral exposure in general.

A Look at How Musical Techniques are Used in Music Therapy and The Effectiveness of Music Therapy
Student Author(s): Megan Ciavardone, Freshman (English)
Faculty Mentor(s): Sara Littlejohn (Residential College)

Music is said to be a universal language; not only does it transcend language barriers, it also transcends emotional barriers. This impact is so great that many therapists now use music as a method of therapy today. Music therapy utilizes a number of musical and vocal techniques to effectively assist patients with different mental illnesses. Specifically, the intentional composition and vocal techniques used in music therapy are effective in improving a person's mental well being by evoking specific emotional responses from the patient. As someone who is interested in music composition and feels strongly about accessible mental health care, I want to further explore how music affects our brains and how music therapy is effective in improving a person's mental and emotional state. Through looking at studies discussing how music affects the brian, such as Music, Feelings, and the Human Brain from an article in the magazine "Psychomusicology: Music, Mind & Brain," I can better understand how specific musical techniques come into play when using music as a form of therapy. Through this research, I hope to discover how music therapy works, how specific musical techniques affect the brain, and prove music therapy's effectiveness so that it can be more widely used in today's society.

Understanding the experiences of marginalized women pursuing a doctoral degree in chemistry.
Student Author(s): Elizabeth Cieza, Post-Bacc (Chemistry)
Faculty Mentor(s): Maia Popova (Chemistry)

The pursuit of chemistry doctoral degrees by marginalized women has been rising recently. Yet, the completion rate of doctoral programs by marginalized women does not correspond to that of non-marginalized peers. Despite this, little is known about the experiences of marginalized women pursuing a doctoral degree in chemistry, and this study seeks to fill this gap. Specifically, this study intends to determine how the experiences of marginalized women seeking chemistry doctoral degrees inform their developed science identity and how their science identity influences their experiences. The intersectionality framework is utilized to better capture how aspects of our participants' various identities combine and lead to unique modes of discrimination and/or privilege. Twenty-nine marginalized domestic and international women participated in semi-structured interviews to probe their experiences in graduate school. The interviews focused on capturing these women's motivations towards persisting in graduate programs and the support they did or did not receive during their PhD journeys. Initial findings suggest that participants have had some positive experiences during their graduate program, such as support from peers, partners, and family; however, negative experiences, such as inadequate departmental support, gatekeeping from the academic community, and tokenization

due to their race, ethnicity, and gender have also been encountered. These preliminary findings and implications will be presented.

Building an Image: Restructuring the Identity and Femininity of Chinese Women from 1949-1976
Student Author(s): Haley Cline, Senior (History)
Faculty Mentor(s): James Anderson (History)

The topic of this paper explores how the Maoist regime impacted Chinese women's rights from 1949 to 1976 to reveal how Mao changed the traditional roles and images of women to prepare China for socialism and the industrial revolution. While most current historiography outlines why women's rights were changed in China, this paper is an explanation of how those changes were enacted top down from the Communist Party to the people. This paper will argue that the Chinese Communist party reconstructed the traditional socio-political status of women when and how they saw fit, by demolishing the restraints of the domestic sphere through the persuasion of the masses, achieved by changing feminine representation in art, plays, and their nationwide propaganda campaigns. Primarily, this paper will analyze propaganda posters produced and controlled in acute detail by the Chinese Communist Party and distributed through China's cities to identify the ideal woman being portrayed and normalized to China's general population. This study also examines primary source writings, slogans, and speeches from China's then leader, Chairman Mao, as well as memoirs from women who participated in the Red Guard. Additionally, examining communist editorials, magazines, and plays from the period, allows for a glimpse into how the cultural revolution entered all facets of life in China, from literature to the stage. Ultimately, this paper strives to contribute to the rich historiography on the women of Communist China and how the Communist Party manipulated their freedoms to the benefit of the nation during the Cultural Revolution.

Regional trade on the Island
Student Author(s): Theresa Cole, Senior (Classical Studies)
Faculty Mentor(s): Joanne Murphy (Classical Studies)

In Late Antiquity (4th and 7th Centuries AD) the Mediterranean was in a state of upheaval experiencing varying levels of instability, invasions, political changes, and eventually the fragmentation of the Roman Empire. My research focuses on the island of Kea, Greece during this period of political and economic turmoil and examines the existence of regional trade routes from the nearby island of Paros. This research utilizes data collected during the Summer of 2022 from the Kea Archaeological Research Survey, and focuses on trade amphora from the 4th-7th centuries AD. By identifying the types of trade amphora on Kea and their distribution on the island, I argue that despite having access to an Empire wide network that stretched over the known world, the people of Kea opted for more local imports from nearby islands based on economic and religious incentives. I further argue that the closer trade networks contributed to economic and population stability on the island.

For Beauty's Sake
Student Author(s): Gabriel Coll-Bettencourt, Sophomore (Music), Eby Buscher, Post-Bacc
Faculty Mentor(s): Robert Wells (Music)

My showing (5 semi-abstract landscape oil paintings accompanied by live recordings of songs which the pieces are meant to represent) reflects themes of the natural world that are emphasized in the philosophy of Transcendentalism. Among these themes are: the ephemeral nature of life, individualism, re-envisioning collectivism to include the natural environment, connecting to one's spirituality through nature, and self-actualization.
These themes address the necessary internal change that people of western cultures ought to make, a distinct shift from the over-consumer mindset that is all too prevalent among social media and advertisement. This shift ought to be made in the direction that Transcendentalists propose: towards self-mastery, spiritual growth, time spent meaningfully by contributing to community/biosphere, etc. These practices transcend the notion of self by connecting deeply with all aspects of life, even the non-physical that are derogatively mystified.
I believe the songs and paintings to be manifestations of Transcendentalism. I express Transcendentalism through artistic formats because it is the truest representation of the philosophical movement. Art transcends physicality through complex visual/auditory patterns that elicit emotion and understanding. Music and visual art are of the oldest human traditions, so it makes sense to use these elements in describing a philosophy that emphasizes the primordial aspects of humans. Have you enjoyed the sunrise this morning, or the way the clouds settled at dusk, or how the breeze felt as you walked outside? If so, you've practiced Transcendentalism to an extent.
However, establishing Transcendentalism at any broad scale is trivial, it is a philosophy that advocates for individualism, it understands spirituality to be a human quality that is broader than dogmatic religions. Alternatively, art enables individualism through self-expression, yet allows broad connectivity through accessing a well of creativity and enjoying natural scenes/sounds. Including two art forms in this showing demonstrates how any artform's technique can be learned, but that the root of creative drive is innate and spiritual, art forms merely attempt to express this deeper understanding

Excavating Pompeii: Researching Domestic Sculptural Artefacts in the House of Menander (I 10, 4)
Student Author(s): Anna Colvin, Senior (History)
Faculty Mentor(s): Robyn Le Blanc (Classical Studies)

This research poster examines the significance of domestic sculptural artefacts found in the House of Menander at the Insula of the Menander - a city block in Pompeii, Italy. After the eruption of Mount Vesuvius in 79 A.D., the city of Pompeii was covered in a thick blanket of volcanic ash and debris, resulting in a unique and fascinating city-wide state of preservation that would be uncovered thousands of years later during archeological excavations. As a result, archeologists and researchers, such as Penelope M. Allison, have extensively organized and cataloged finds at this site, especially in the so-called "House of the Menander" (House, I 10, 4), where my research is focused. Utilizing a cataloged database - a companion to Allison's research - I could pinpoint where certain sculptural artefacts were found inside the house and what they were made of to help determine their potential significance. My research focuses on what these

might have been used for and what they might suggest about the domestic lives of individuals that lived in the house and around the ancient city of Pompeii.

How are the psychological impacts more influential on female competitive gymnasts than the physical impacts?
Student Author(s): Rachel Colvin, Senior (Kinesiology)
Faculty Mentor(s): John Sopper (Residential College)

Many professional athletes say that to achieve maximum performance, you must pay equal attention to your physical and mental health. What they don't say is that it's okay to speak up about your physical and mental injuries. When athletes of any sport reach a competitive level that is far higher than that of the average human skill level, the lines of "I'm hurt" and "I'm just sore" often blur. This can lead to deeper injuries, often on the psychological level. My research focuses on the question "how do the psychological impacts from competitive gymnastics compare to the physical effects for female gymnasts". To find answers to this question, I utilized journal articles, research studies, dissertations, websites, books, and personal knowledge, and also conducted personal interviews with some former teammates. Through my research, I found that the primary reason that the psychological effects are more impactful than the physical is due to the increased healing time and also the complexity of our brain. This research can help aid individuals involved in athletics to find ways to aid in the search for cures for mental illness in the world of athletics.

Trade and Community Change in Kea, Greece: A Bronze Age Case Study
Student Author(s): James Cone, Senior (Archaeology & Anthropology)
Faculty Mentor(s): John Sopper (Residential College)

One of the prevailing debates about the Middle to Late Bronze Age Aegean (c. 1700-1400 BC) in Greece focuses on the question of how much control Minoan Crete exerted in the region. The discovery of Minoan made pots at sites outside of Crete is used as the basis for this argument. This argument, however, equates trade and exchange of goods with political and economic control and ignores the transformative impact that trade with a dominant power can have on an independent group's cultural traditions. In contrast to this argument, by examining pottery from the island of Kea in the Cyclades, I show that while there were some imports from Crete found on the island, much of the Cretan looking pottery was locally produced and was emulating the foreign imported styles. I examined multiple domestically produced ceramic examples from this period near the site of Ayia Irini, the largest Bronze Age site on the island, that appear to reflect the adoption of Cretan ceramic traditions. In turn, these ceramics I placed within the context of Cretan migration to demonstrate how migration during this period led to the adoption of Minoan ceramic traditions on the island of Kea. This phenomenon can be particularly seen at the site of Ayia Irini, during phases five through seven of the site's occupation from 1700 to 1500 BCE These ceramics, alongside known Cretan imports from the Kea Archaeological Research Survey (KARS), are used to demonstrate processes of cultural emulation during the late Bronze Age Aegean.

ABSTRACTS

Exploring the Role of Universal Design in Promoting Awareness of Sustainability
Student Author: Kerry Cope, Senior (Consumer Apparel & Retail Studies)
Faculty Mentor: Dr. Jin Su (Consumer Apparel & Retail Studies)

Universal design has developed to take into account not just physical function but other factors that promote well-being in our increasingly socially progressive and technologically advanced era. That being said, universal design has evolved to prioritize human-centered issues and social inclusion. Universal design is the process of creating products that are accessible to people with a wide range of abilities, disabilities, and other characteristics. This can be anything ranging from people with disabilities, different body types, or different age groups. One important application of universal design is adaptive apparel design for people with disabilities. Disabled people constitute the largest minority group in the world, yet are the most underserved and underrepresented. Universal design is an important process for many reasons ranging from legal to ethical, economic, and practical. These are all driving motives for executing and exploring the impact and value of universal design as a method for innovation. Some of the benefits to consumers include increased comfort, fit, accessibility, and user satisfaction. Using the case study research approach, this study aims to: (1) to explore the impact of universal design on consumers, and (2) to investigate the connection between universal design and the awareness of sustainability.

Photosynthetic Purple Bacteria for Self-Powered Battery
Student Author(s): Eric Daly (Biology), Ndepana Andrew (Biology)
Faculty Mentor(s): Hemali Rathnayake (Material Science), Tetyana Ignatova (Nanoscience and Nanoengineering)

One of the most significant problems in existing energy storage devices is inability of self-charging, by providing harvesting, conversion, and storage in a single system for sustainable energy. In current energy systems there is a modular approach that relies on each other's efficiency interfacing to achieve and overall efficiency. Leading to a loss in overall efficiency at each module attached. The only solution is the "self-charging" power cell, with the implication being that the cell can have all the capabilities it need to harvest and convert sunlight into energy. Photosynthetic purple bacteria have ability to provide highly efficient biophotonic processes leading them to be an excellent candidate as a harvesting and converting source. The use of a pigment from natural bacterial photosystems that absorbs energy across the solar spectrum and transiently stores harvested energy through charge separation has been realized in the past. This research focuses on creating self-powered system using a photosynthetic bacterium, Rodobacter Sphaeroids. To do this, we will use the metal ion coordinated siderophore in energy transfer process. Optimal growth will be determined by CFU and a growth curve based on optical density. This research has implications to create a self-charging, environmentally sustainable, and portable power cell that can power small devices in places where the availability of power is limited.

The Problematic Nature of the American two-party System
Student Author(s): Bryan Daniels, Sophomore (Political Science)
Faculty Mentor(s): Sara Littlejohn (Residential College)

The United States has long had a solid two-party system. It can be traced back to the country's foundation, having become permanently linked to the United States, merging itself into its culture and institutions. In this project, I will argue that this system creates a situation where the two large political parties benefit from a system that locks out independent and third-party candidates from running for office, thus, limiting voters to only two choices. I will claim that the lack of competition outside the two major parties is created through the plurality voting system in most states and highlight the difficulty third parties face when obtaining ballot access and recognition in several states. By using sources such as; "Grand Illusion, the myth of voter choice in a two-party tyranny" and others in my field. I will conclude that there is some support for a third party to emerge but that without change on the state level to make it easier for third parties to compete, the two-party system will persist with the consequences it brings with it. Despite still being a democracy, a two-party system makes America uniquely undemocratic compared to other states where residents enjoy similar rights and freedoms.

Effect of Parenting Status on Children's Perceptions of Women's Leadership in STEM Fields
Student Author(s): Audrey Day, Senior (Psychology)
Faculty Mentor(s): Janet Boseovski (Psychology)

Research indicates that young children are affected by gender stereotypes about science. In adults, there is evidence that motherhood is one potential barrier for women's participation in science careers, but little is known about how children perceive motherhood in relation to the possibility of such careers. This ongoing study investigates the effect of parenthood status on 6- to 10-year-old children's perception of women's suitability for STEM. Fifty participants were told about a mother and a childfree woman and asked which character would be better at certain careers (scientist, teacher, surgeon, and artist). Preliminary findings indicate that 9- and 10-year-olds systematically chose the mom as a better teacher and the childfree woman as a better scientist but were unsystematic in choosing who would be a better surgeon or artist. Younger children's selections did not differ from chance for any careers. Preliminary findings also indicate that there were no differences in judging which character was more helpful, confident, or strong, but that the older children were less likely than younger children to judge the childfree woman as less loving. Revealing biases or misconceptions about women, motherhood, and STEM is an important step for designing potential interventions that encourage science participation in girls.

Cortical Field Re-Education Research and Analysis
Student Author(s): Brandy Day, Senior (Dance)
Faculty Mentor(s): Teresa Heiland (Dance)

This study analysis investigates the ways in which a somatic practice modality called Cortical Field Re-Education can improve dancers' posture and dynamic alignment to improve functional

movement. A repeated-measures, once-a-week study over fourteen weeks using video capture and audio capture of discussion reflections. Two analytical methods followed: (1) I used qualitative ground theory approach analyzing anecdotal experiences shared by participants during the last 15 minutes of each session using coding, sorting, categorizing, and forming of significant themes; and (2) Patterns of Total Body Connectivity, a qualitative movement analysis system using a Likert-type scale, to capture changes in dynamic alignment in human movement. Laban Movement Analysis uses an established protocol which I normed with my mentor to ensure reliability using a Likert-type scale to represent levels of change for each category of analysis. A summary paragraph captures each person's profile after each day to reflect potential changes over time. Together the (1) grounded theory data and (2) Patterns of Total Body Connectivity human movement Likert-type data and subsequent summary will inform what is experienced and resultant due to the somatic modality.

Substrate Synthesis Towards Aminodifunctionalization of 1,3-Dienes
Student Author(s): Jonathan Dean, Senior (Chemistry)
Faculty Mentor(s): Kimberly Peterson (Chemistry), Qiu Wang (Duke Department of Chemistry)

A key motivation for advancements in synthetic chemistry is the development of effective methods for preparing complex chemical motifs that are valuable in pharmaceutical fields. Nitrogen-containing motifs are often key components in bioactive molecules, making them important synthetic targets of interest. One approach for accessing these complex motifs is the use of difunctionalization reactions, or the simultaneous installation of two functional groups. The goal of this research was the development of a method for the copper-catalyzed installation of an amine and a hydroxyl group onto 1,3-dienes using O-benzoylhydroxylamines as the nitrogen source. Synthetic work described involves the preparation of a target thioamide diene and several hydroxylamine substrates. Results from the difunctionalization of the thioamide diene revealed further applicability of the reaction for the installation of a thiol group. This expands the range of chemical motifs accessible via this method to include sulfur-containing functional groups, providing valuable building blocks towards the synthesis of complex bioactive compounds.

An Attractiveness Halo on Perceived Friendliness is Stronger for Direct versus Averted Gaze Faces
Student Author(s): Brendan Diaz, Senior (Psychology)
Faculty Mentor(s): Brittany Cassidy (Psychology)

The Attractiveness Halo refers to a tendency for people to attribute more positive traits to more attractive faces. Although the Attractiveness Halo is broadly replicable, little work has examined effects of other non-verbal cues on this relation. Because direct relative to averted gaze elicits perceptions of greater approachability, we tested whether gaze direction also affects the Attractiveness Halo. We defined the Attractiveness Halo as the expected positive relation between facial attractiveness and evaluated friendliness. People viewed male and female faces varying in facial attractiveness one at a time that had either direct or averted gaze and evaluated each face on its friendliness. People perceived direct relative to averted gaze faces as being more

friendly. Moreover, the positive relation between facial attractiveness and evaluated friendliness was stronger for direct relative to averted gaze faces. These findings suggest that different non-verbal cues act in concert to elicit face evaluations. Moreover, these findings suggest that the strength of the Attractiveness Halo depends on other non-verbal behavior perceived on target faces.

Understanding the Tropes of Ancient Epic
Student Author(s): Ethan Divon, Junior (Classical Studies)
Faculty Mentor(s): Sara Littlejohn (Residential College)

Mythology — both classical and modern — permeates through the world we live in. From the way we view the conception of a hero, whether firefighter or superhuman, to the way we define ourselves and others, mythology has a firm grasp on the perceptions of modern society. Despite the prevalence of ancient mythology in this era's storytelling, there is a striking lack of understanding within the general public of how mythological texts converse and communicate with each other and the modern day. I argue that breaking down and analyzing the patterns and tropes found across multiple ancient texts will result in a more concrete understanding of the narrative heritage we have received as a society. Furthermore, by establishing this understanding, I argue that interpreting and appreciating modern literature will be more accurate to the historic traditions that inspire and influence. By examining key texts such as the *Iliad*, *Odyssey*, and *Gilgamesh* as well as the larger mythoi such as the *The Egyptian Myths,* the King Arthur canon, and East Asian mythology, this research will show clear mythic tropes and themes found across time and space, and, as such, it will establish not only a connection between mythology of the past but into the present as well.

A Home for Lost and Forgotten Things: The uses of Orphan and Legacy Collections in the Study of Numismatics
Student Author(s): Megan Elmore, Senior (Archaeology)
Faculty Mentor(s): Robyn Le Blanc (Classical Studies)

Often times museums and universities are in the possession of collections or artifacts that have an unknown origin or a shady past. It has been common practice to refuse to acknowledge or study these collections- so that we don't inadvertently increase the value or validity of objects within the illegal antiquities trade market. These collections- and what little information or history is known about them- are finite resources that are rapidly disappearing. It is our responsibility to study these objects and record their history while we still have the chance because the objects themselves do still hold value for further academic study and community engagement.

Harmony Grove: The Harper Family Graveyard
Student Author(s): Megan Elmore, Senior (Archaeology)
Faculty Mentor(s): Linda Stine (Archeology)

As limestone breaks down and granite weathers away, the words chiseled into the headstones of people who have passed are too often forgotten. A few hundred feet from the entrance to my

neighborhood is a chain-link fence encircling what is left of a graveyard with its origins dating back to the late 1700s. After spending countless hours mapping and recording the information on the headstones that were still legible, changes in the style and language on the headstones are able to give us an insight into the ways the society developed over time. These insights are able to give us a snapshot of the life of those buried within the graveyard- before their headstones were made. According to some death occurs twice for an individual- the first is when the life is lost, and the second is the last time someone speaks their name. Studying these forgotten cemeteries offers us the chance to let the people buried there live a bit longer- even if it is only in our memories.

How Christian Nationalism and the Religious Right Act Against Christian Ideals
Student Author(s): Gates Emmert, Sophomore (Anthropology)
Faculty Mentor(s): Sara Littlejohn (Residential College)

Christian nationalism poses a threat to the nation through dangerous theology that impacts every American, while pushing "Christian ideals" onto those who do not accept them. The significance of religion, specifically christianity, and its impact on Christian nationalism has always impacted the country, but it gained political mobilization in the 1970's. The religious right is rooted in racism and a desire to maintain segregation. Using interviews with researchers and theologians, this paper argues that christianity had a critical impact on American history that has developed over time to remain relevant and prominent. Primary sources and secondary research will confirm the development of christianity's impact on the government primarily for the worse. Research is conducted with both interviews and observation straight out of Washington DC of behaviors and symbolism that portray religious dominance and control of the government and politicians. There is truly nothing Christian about the 'Christian right'. Christian ideals have been twisted into something that is solely hatred in the name of God. This paper will cover the ways that christian nationalism has harmed the country and reveal the ways that bigotry has found a home in christian nationalism.

The Feasibility of Rhythmically Entrained Exercise in Community-Dwelling Older Adults with Mild to Moderate Impairment
Student Author(s): Ata Erdogan, Post-Bacc (Kinesiology)
Faculty Mentor(s): Kyoung Park (Kinesiology)

This study explored the feasibility of a music-based intervention for multimodal exercise training among community-dwelling older adults. 13 older adults aged 85±9 years ($M \pm SD$) who were previously low-active (< 60 min/week of exercise) were recruited from a local senior living community. Considering participants' music preferences, we developed a playlist of beat-accented tempo-synchronous music and developed a multimodal exercise training program following the national physical activity guidelines. All participants were offered exercise training sessions for 6 days/week and encouraged to attend more than 4 days/week over 20 weeks. Each session consisted of 20-min aerobic training at moderate-intensity and 10-min strength and balance training along with 5-min dynamic warm-up and cool-down stretches. Every month during the intervention, there were progressive increments in exercise pace implemented by increasing music tempo from 85 to 100 (beat/min, BPM). As a result, participants attended > 4

days/week over 20 weeks in average and reported high satisfaction with the intervention (90 out of 100). Participants also showed significant improvement in cognitive functioning and aerobic fitness. These findings support the feasibility of a novel music-based exercise intervention and set the stage for future studies to test the efficacy of music stimulation for exercise training.

Neotaphonomy of a "common amenity" on the Serengeti Plain, Tanzania
Student Author(s): Maegan Deana Ferguson, Senior (Anthropology)
Faculty Mentor(s): Charles Egeland (Anthropology)

Numerous sites in and around Olduvai Gorge in Tanzania have yielded rich fossil assemblages that allow paleoanthropologists a glimpse into the lives and diets of Early Pleistocene hominins. The questions remain then, (1) how did these assemblages form, (2) what factors contributed to which bones are deposited and preserved, and (3) why are some bones more prevalent than others? Neotaphonomic analyses of modern landscapes can be a useful tool for answering these questions. Local Maasai groups herd livestock and carnivores hunt through and around Olduvai Gorge, leaving faunal remains on the landscape. Olduvai Transect 2 (OT2), a seasonal waterhole surrounded by trees and bushes, was surveyed, and the bones were collected and analyzed. Two sub-assemblages were identified: (1) an abandoned Maasai boma and (2) a carnivore kill-site. The bones from the boma assemblage showed signs of both human- and carnivore-induced damage, while carnivore kill-site showed signs of exclusively carnivore-induced damage. The majority of both assemblages showed only slight weathering (stages 1 and 2). Most of the long bones from the boma assemblage retained most of their original circumferences, whereas the long bones from the carnivore kill-site showed a relatively even distribution of circumference types. The boma assemblage consisted primarily of the upper hind anatomical region, whereas the carnivore kill-site consisted primarily of the lower front anatomical region. These findings may provide insights into how fossil assemblages formed, by emphasizing (1) how hominins and humans modify bones, (2) how carnivores modify bones, and (3) how modified bones are deposited on the landscape. OT2 may be an insightful example of and model for G. Ll. Isaac's "common amenity" concept for the formation of fossil assemblages.

Lack of support from the administration for teachers can increase the teacher turnover rate
Student Author(s): Ashley Fling, Sophomore (Human Development and Family Studies)
Faculty Mentor(s): Sara Littlejohn (Residential College)

Teacher turnover has been a problem for many years in the teaching profession. Between the low pay, violence, and lack of support from administrators; teachers have felt like they have no place to turn when they are tired. The lack of support from administrators is seen all over the school system and the news. In order to teach new teachers, we have to talk about the ways that administrators can provide support for their teachers when they need them the most. In order to gain the trust of a student and their families, you as a teacher have to be willing to jump through all of the hoops to make sure your students and their families are provided with the best resources. This help teachers when they're in need of help, they will have someone who could vouch for them. The website Scilearn has an article on Teacher Turnover: Why It's Problematic and How Administrators Can Address It, interviews with current teachers and former

administrators, and blog posts. This research will discuss why teachers may leave the profession and how much it costs the school system for every teacher who has left.

Diana
Student Author(s): Brenda Fonseca Martinez, Senior (Art)
Faculty Mentor(s): Barbara Cambell Thomas (Art)

"Diana" is an 85"x30' textile work consisting of patterned fabric sewn onto the cotton duck. This work of art is my attempt to recreate an old drawing that my younger sister drew of me and my childhood friend Diana Sanchez. She passed away due to a car accident in 2017. After her passing, I promised her mother and her family I would live for her. My soul, mind, and body live for her as she lived for me.
"Diana" captured the moment when I said yes to her asking the question and our body, soul, and blood became one with the two girls holding hands sowed with red string with the girl with the pink dress asking the question "Can you live for me?" and the girl on the left responding "yes" in Spanish.
In "Diana" I emulate a juvenile approach to drawings. This pays homage to my childhood friend. I also used vibrant colors in the background and in our clothes. I didn't use natural tones and colors because I believe they would take away from depicting a childhood environment.

Women in male-dominated industries is the new norm
Student Author(s): Arisbeth Garcia Cervantes, Sophomore (Management)
Faculty Mentor(s): Sara Littlejohn (Residential Colleges)

For readers to learn more about women's personal experiences while working in male dominated industries, and inspiring more women interested in these types of fields to not be afraid. Women should not feel alone and support each other as being a woman, especially a woman of color can be difficult especially in male dominated industries, this topic is really important for women all around the world. Readers will learn from the National association of Women in construction as well as personal experience from women in NC working in a construction site. This research will be a way for more women to find out about what their future can hold and be an eye opener to world wide society that diversity is key and people's perspective should not hold us down to what each one of us is capable of achieving. We know women in male dominated fields have had an increase throughout the years but there is still sexism and discrimination that many women have faced worldwide in the industries.

How does childhood abuse impact a person's adulthood
Student Author(s): Aspasia Gardener, Sophomore (Psychology)
Faculty Mentor(s): John Sopper (Residential Colleges)

My study seeks to answer the question of how experiences of abuse in childhood affect people's behavior as adults. I find that there indeed is a strong relationship between childhood abuse and psychological behaviors. I find that people who experienced childhood abuse are more prone to depression and aggression. I also find that many victims of childhood abuse feel stuck in the past and unable to move on from what they endured. They often feel disconnected from the people

around them. These findings can help victims of childhood abuse better understand how their past environments influence their psychological behavior and mental health as adults. They can better understand how their experience with abuse has impacted them, and hopefully this understanding will contribute to improvements in their mental health.

Vector-borne disease in a warming climate and what it means for humans
Student Author(s): Katelyn Garton (Biology)
Faculty Mentor(s): John Sopper (Residential Colleges)

Concern with malaria is widespread and well known. Efforts to understand and control malaria are long-standing among researchers and public health officials. At the same time, while malaria is certainly dangerous and deserves attention, it has many vector-borne cousins, like the dengue virus, that may be more potent in the coming years of climate change. Under increased temperatures, other arboviruses (vector-borne diseases) may surpass the threat posed by malaria, significantly increase disease burden, and cause higher morbidity, especially among lower-income populations, persons of color, and in many third-world countries, which we already see today. Therefore, in this study, I investigate these lesser-known and lesser-researched arboviruses. I use archeological research and research on contemporary populations and conditions to learn more about the variety of arboviruses and inform my fellow students and colleagues about disease ecology. The dangers of arboviruses as the earth warms. I find that the vectors that carry these diseases typically prefer warmer climates, that the diseases themselves prefer warmer and wetter climates, and that given current conditions and the lack of an adequate response, less privileged populations will likely be hardest hit by arboviruses on a warming planet.

How do religion and spirituality affect mental health?
Student Author(s): Jasmine Gash (Psychology)
Faculty Mentor(s): John Sopper (Residential Colleges)

Religion provides explanations and structures for people's lives. During a time when mental health is at the forefront of discussion, many people are leaning on their religion to help them cope with everyday stress, while others are ditching their religious beliefs altogether. This leads to my research question: When trying to navigate and improve one's mental health, how does your belief system affect the progress of your mental growth and stability? To answer this question, I reviewed scholarly journals and research studies that examine religious practices and how they affect an individual's mental health. I find that certain aspects of religion such as frequent service attendance and identifying with a central religious figure can help improve mental health while other aspects such as religiously enforced stigma toward mental illness are a barrier. Spiritual, and religious practices are increasingly being secularized and incorporated into clinical practices. I find that overall, religion has more of a positive impact on mental health than a negative one. Therefore, mental health professionals should take a spiritual history to determine whether a patient's religious based practices are a source of help or a liability.

Estimating Joint Health State Utility Algorithms under Partial Information Using SF-6D and EQ-5D
Student Author(s): Abraham Gebreselassie (Economics)
Faculty Mentor(s): Bray Jeremy (Economics)

Cost effectiveness analysis (CEA) provides a quantitative measure of value by simultaneously comparing the costs and outcomes of one intervention to another. To ensure valid comparisons across a variety of health conditions, best practice guidelines recommend that quality-adjusted life years (QALYs) be used as the outcome measure. QALYs combine both length and quality of life as measured with health utility, ranging from 1 (best health) to 0 (death) capturing individuals' preferences for living in different health states. While calculating health utility for a single condition is straightforward, because of the volume of possible joint health conditions algorithms for combining health state utilities for individually occurring conditions into multiple-state utilities are needed. Different utility measures give different values for a given health state, which might yield different results for joint health states based on which algorithm is used. A previous publication by Bray et al (2022) found that one algorithm predicts joint conditions better when using a specific utility measure but did not look at how that result might change when using different utility measures. This study looks at multiple comorbid conditions using the two commonly used utility measures to find the best algorithm that can be applied across all health conditions and different measures of health utility.

The Integration of AI in Our Lives
Student Author(s): Samuel George (Computer Science)
Faculty Mentor(s): Sara LittleJohn (Residential Colleges)

Combating the fears of AI can be done by preparing now, and using it to our advantage by benefiting from it in our lives. As artificial intelligence grows, it causes worry about the future state of jobs, the economy, the potential for our place in the world, and so much more. Yet, with the access that the general public has to AI, people can advance their workflows and lives because of AI. Working alongside AI is the best step forward, for a more efficient and progressive future. Artificial Intelligence has grown a tremendous amount in the past few years and it will continue to do so. So how can the world progress alongside AI? With recent public access to AI, many people have shown how AI can be used to our advantage. "How AI Simplifies Your Workflow", an article by the 'Chanty' blog is proof that people have looked into this. Studying it, practicing a lifestyle with it, and fully incorporating something that has a permanent standing in our futures is exactly how to do this. With enough resources and studies from other sources, a solution definitely exists. People will never be defined as "obsolete" because of AI.

Testing Accounts of Fake News Reminder Effects in Older and Younger Adults
Student Author(s): Aaron Goldman (Psychology), Paige Kemp (Psychology)
Faculty Mentor(s): Chris Wahlheim (Psychology)

Misinformation is defined as misleading or false information that is presented as true. When included in news stories, it is often referred to as fake news. The increase of fake news in recent years has yielded dangerous consequences, especially during the outbreak of COVID-19.

Previous research conducted at UNCG has shown that both memory and belief accuracy for true information is improved when people are reminded of a false claim before being shown its correction. These effects have been witnessed in a population of young adults, but as one ages, the abilities to encode and remember information are impaired. Our study compares the effects of fake news reminders on both younger and older adult populations. Our preliminary results replicate previous findings among young adults; misinformation reminders followed by corrections were more effective than labeled corrections appearing on their own. For older populations, fake news reminders could similarly allow for better distinction between true and false information, thus improving memory for both. However, reminders may instead produce a familiarity backfire effect, in which false information that is more familiar is mistaken to be more accurate. Understanding potential differences between these two groups could guide fact checkers and social media sites looking to limit the pervasive influence of misinformation.

Voices of the Silenced: How Censorship Discourages Education
Student Author(s): Haley Goode (History)
Faculty Mentor(s): Sara LittleJohn (Residential Colleges)

Availability of educational, literary tools in public schools is a fundamental right to the young people of the United States. Censorship in public schooling is detrimental to the education of students as it takes away books, novels, journals, and even full curriculums from the hands of students. It diminishes critical thinking skills, creates mistrust between teachers and students, and overall devalues the merit of their educational experience. I plan to fully argue that book banning and censorship does not prevent students from accessing "harmful" materials, as it only creates unsafe outlets to find information on experiences they will face day-to-day as adults. I also want to argue that those banning the books are simply power-hungry individuals who feel threatened by the truth. By using sources such as the Journal of Law and Education, other peer-reviewed scholarly journals, two novels about this exact topic and web articles written by scholars who fight for this cause daily, I will be able to successfully conclude that book censorship does more harm than good. My research will support this cause and offer perspectives that highlight the modernity and immediacy of censorship in public schools now, and why we as educators and students should continue to fight for our access to information.

Investigating The Evolution of Intermediate-Mass Young Stars: A Spectral Survey
Student Author(s): Jack Griffin (Physics & Astronomy)
Faculty Mentor(s): Alicia Aarnio (Physics & Astronomy)

To understand the origin and evolution of our own solar system, we must look to other developing star systems. Since their discovery in 1960, Herbig Ae/Be stars have been thought of as higher-mass analogs to our sun suitable for direct comparison. However, recent observational efforts hint that these stars' evolutionary paths are quite different.
We have obtained and analyzed high-resolution spectra of ~60 intermediate-mass young stellar objects. By measuring the chemical composition and changing velocities of these bodies, we determined stellar properties and searched for periodic signals in the systems' motion. We present spectral type estimates assigned to our sample of young stars, based on the relative strengths of temperature-sensitive chemical signatures. Within the sample, candidates for

exoplanet hosts were also analyzed. We present these results as well as a few interesting cases serendipitously discovered.

The Evolution of Mythological Heroes and their stories through Reception
Student Author(s): Jamie Gross (Classical Studies)
Faculty Mentor(s): Sara LittleJohn (Residential Colleges)

Mythological heroes such as Hercules and King Arthur have been around for hundreds, if not thousands, of years. However, our versions of these heroes are different from the characters who originated centuries ago. Modern morals and religious beliefs have often been the catalyst for evolution in these heroes' stories. These adapted versions of heroes are changed to fit their new mediums and audience. For example, you can't have Disney's 1997 Hercules murder his wife and children because it wouldn't fit our modern standard of what a hero should be. As a Classical Studies major with interest in stories and mythologies, the evolution of these stories throughout time is a great fascination of mine. Percy Jackson and the Olympians by Rick Riordan was a spark that contributed to this fascination. These novels are a great example of how mythological stories have been adapted to different mediums for new audiences. By using sources such as the article *Re-Discovering Mythology: Adaptation and Appropriation in the Percy Jackson and the Olympians Saga* and books like *Epic Heroes on Screen* and *Ancient Epic in Film and Television*, I will explore the question of how mythological heroes and stories evolved through adaptation and appropriation. I will use Hercules and King Arthur as individual case studies and look at the Percy Jackson novels as an overall reception of myth. My research will discuss how the medium, audience, and author have impacted how these stories have changed throughout time.

Understanding Magnetic Field Generation in Intermediate-Mass Young Stars
Student Author(s): Madison Gullett (Physics & Astronomy)
Faculty Mentor(s): Alicia Arnio (Physics & Astronomy)

Despite the evidence of incredibly strong magnetic fields on young, sun-like stars, we see that with increasing mass, magnetic fields are less detectable observationally. To work around this limitation, we are simulating convection zones in these new stars with the goal of modeling their magnetic fields. A combination of convection and rotation is understood to produce these fields on stars, much like the dynamo in Earth's core produces our magnetic field. We have generated 1-dimensional computational models to represent various interior properties of these stellar objects, such as their temperature, density, and pressure as a function of radius. Our results have shown us where convection begins at specific time steps in the formation of stars. We can see the dependence of internal stellar structure on a star's mass in our study of stars of various masses.

Life in exchange for Fast Food
Student Author(s): Karma Gurung (Kinesiology)
Faculty Mentor(s): John Sopper (Residential Colleges)

The US fast-food industry has reduced food quality while also creating poor working conditions for many people. Along with these issues, it seems to ruin the health of the public as well, especially by contributing to the rise of obesity. I believe the public in general needs to become familiar with these issues, and better understand how we came to have such a large and influential fast-food industry. Therefore, I researched the question What factors led to the massive expansion of the fast-food Industry in America. I answered this question by sifting through existing research studies, government databases, and research conducted by non-profit organizations concerned with public health. By bringing to light what many Americans are consuming in their day to day life, the impact it has on overall health, and how the fast food industry was developed and expanded I hope to better understand why the public consumes fast food and why it is so easily accessible.

An Investigation of Composer Race, Ethnicity, and Gender Included in The Texas UIL List
Student Author(s): Claire Haneberg (Music Education)
Faculty Mentor(s): Rebecca MacLeod (Music Education)

There are numerous reasons for music educators to include music written by diverse composers as part of the curriculum, but among the most important reasons is to provide representation to students enrolled in the class. Images, same-race and same-sex role models, and the curriculum all contribute to students' sense of belonging in the classroom (Egalite et al, 2015; Gay, 2018). A large portion of the orchestra curriculum consists of the repertoire performed by the ensemble, so it is essential that teachers program the music of historically excluded composers. The purpose of this study was to investigate composers' race/ethnicity and gender of the pieces included on the most commonly used list of approved music for ensemble festival performance, The Texas University Interscholastic League approved music list.
The grade 3, 4, and 5 string and full orchestra pieces listed in the Texas UIL database, available publicly online, served as data for this study (N = 1,336). Data analysis revealed that 90.94% of all pieces were composed by men, 4.42% by women, and 0.89% by composers of unknown gender. Composers were white (91.69%), asian (1.1%), jewish (0.45%), black (0.67%), and hispanic (0.45%).

Improvement
Student Author(s): Kelsey Hausler (Art)
Faculty Mentor(s): Lee Walton (Art)

https://www.youtube.com/watch?v=EWDCp7iC7VQ
I am an artist who likes to play, and I create works that express the enjoyment I feel when creating them. I like to create art that encourages curiosity and humor in the audience. Humor is unique to each person, and I am most pleased when an audience finds something humorously

relatable in my work. My goal in this project was to take the prompt of "improving public space" and make it light-hearted and engaging through laughter. In this piece, I approached the topic from unique angles, creating a change in expectation to the viewer.

Brenda Chapman: Bringing Princesses to Pixar
Student Author(s): Brooklyn Haynes (Art)
Faculty Mentor(s): Heather Hollian (Art)

Brenda Chapman joined the Walt Disney Studios in 1987 to work on *The Little Mermaid* (1989), and continued her career as a story artist before becoming head of story for *The Lion King* (1994). After Disney, she helped launch Dreamworks Animation, where she co-directed *The Prince of Egypt* (1998), making her the first woman director of an animated feature film for a major Hollywood studio. Chapman joined Pixar in 2003 and began directing *Brave* (2012), bringing princesses to Pixar. *Brave* made Chapman the first woman director at Pixar, and won the Academy Award in 2013 for Best Animated Feature, making her the first woman to win this award. Chapman has also worked for Dreamworks, Fox, Lucasfilm, and Sony, and now leads 'Twas Entertainment.
To highlight Chapman's impact, this project will create a timeline of her major career accomplishments using interviews, academic sources, and her own writings. I will illustrate her accomplishments through her work as a woman in animation with an aim to highlight the impact she has had on animation as a whole.

Social media and Beauty Standards
Student Author(s): Cheyenne Henley (Media Studies)
Faculty Mentor(s): Sara LittleJohn (Residential Colleges)

Social media and the features they add such as filters are the core issue of unrealistic beauty standards and have influenced teens & has changed their ideas of how to look
Social media has been helpful in many ways, but over the years these apps have included filters, like buttons and story likes which influence people to want many people on their pages to like and see who they are. For some, teens see the number of likes on a post and tend to want that same attention but the people in the photos with the many likes portray these fake likes and have had their bodies done and when teens see this they want to alter the way they look. I argue that social media is corrupting teens' images of beauty and is creating these unrealistic ideas of how one should look which is leading to many teen mental health issues to arise. Using sources like the book Beauty by Bri Lee and an article by T. Ryan- Mosley The fight for "Instagram face" I want to inform readers of the issues and the importance of the percentages of teen's mental health and the number of teens going through depression and feeling the need to change themselves for other people to accept them. These apps are all part of these issues and will have to be fixed.

In the (Good) Old Days
Student Author(s): Laura Hernandez (Art)
Faculty Mentor(s): Jennifer Meanley (Art)

My works allows the combination of symbolic visuals and realism to enlighten the display of a

vague subject that is rapt with an intense background full of underlying meanings. It is also an attempt to work with different palettes that I perceive to correlate well with my theme. From the space the subject matter is laid within, I want to convey the turmoil that can be felt upon viewing my illustrations.
The subjects within my artworks are deliberately shown as interrogations of my past, a topic that I analyze as to how it has shaped me as an individual, especially as a woman. I express trauma and challenging experiences that had happened in my own life through these works; fears that I overcame or still need to get over manifesting into a visual display created by my own hands. I evoke this understanding of myself as something that is both vulnerably shown and at the same time, hidden from the audience for the reason that this vulnerability is hidden behind a mask that is created of symbolism in the bounds of my works.

Life Simulator Games and Their Effect on Stress
Student Author(s): Ameena Hinchliffe (Theatre)
Faculty Mentor(s): Sara LittleJohn (residential Colleges)

Playing life simulator games is a healthy escapism for its players, and has the ability to decrease stress greatly.
The topic I am researching is life simulator type games and how they affect the player's stress levels. The reason I am interested in this topic is because I grew up playing life simulator games. These types of games also became extremely popular during Covid-19, which was an extremely stressful time. Life simulator games were a great way of escapism for people during lockdown. In the games you are able to do essentially anything, allowing players the freedom of creativity that they crave in day to day life. Sources in the research would be licensed therapists advice on how to handle stress and relating it back to different types of activities in life simulators. A survey will go out for life simulator players, asking questions such as "what aspects of these games can help with stress". Books that cover how video games can affect your mental health will also be used, such as "Video Games and Well-Being: Press Start" by Rachel Kowert. With the research and information I find I hope to find a new positive way to handle stress and help people consider it as a legitimate way to handle stress.

A Genetic Assay Identifies Effete as an E2 Ligase That Interacts With dTopors in *Drosophila melanogaster*
Student Author(s): Kathy Hoang (Biology), Marianela Solano-Alejo (Biology)
Faculty Mentor(s): John Tomkiel Dean (Biology)

Drosophila Topoisomerase I-interacting protein (dTopors) is the fly homolog of the human tumor suppressor gene. In flies, it is a E3 ubiquitin ligase involved with the process of ubiquitination in the male germ line. Ubiquitination is a post-translational modification in which ubiquitin is covalently bound to lysine residues of target proteins either to mark them for degradation or to modify their function. There are three proteins within a ubiquitination complex that interact. The E1 ligase activates ubiquitin, then transfers this molecule to the E2. The E2 and E3 enzymes work together to mark the target protein. If one enzyme is removed, this process of ubiquitination cannot be carried out properly. In *D. melanogaster*, there is a single E1 activating enzyme (*Uba1*), but 29 E2 conjugating enzymes. Here we performed a genetic screen of E2 mutations to identify those that act with dTopors. We identified mutations in *effete*

as enhancers of chromosome nondisjunction induced by a hypomorphic *dtopors* mutation. Future studies will use the yeast two-hybrid system to verify physical interactions between Effete and dTopors.

Urban Renewal Project and Warnersville
Student Author(s): Anna-Kristina Hoffman (Archaeology)
Faculty Mentor(s): Linda Stine (Archaeology), Jeff Patton (Geography)

In order to better understand the impact of the Urban Renewal Prect, I looked at the first Black community in Greensboro, North Carolina known as Warnersville. The Urban Renewal Project was a federally funded project which determined what neighborhoods in the United States were subpar in accordance with the federally set standards. In the summer of 2022, I worked with Benjamin Briggs at Preservation Greensboro to help gather information to potentially have Warnersville on the National Registrar of Historic Places. I used city directories (or phone books) from the years 1949, 1959, and 1974 to gather the names and addresses of the people who lived within Warnersville at those times. I then went through each year and name to determine who lived in Warnersville pre-Urban Rewal Project and moved back after the community was rebuilt. Using ArcGIS, I geocoded the addresses of where the residents moved back to. From this data, I determined that people were more likely to move back to areas that were in high demand, including community hubs such as where schools, businesses, or churches were located, pre-Urban Renewal Project.

Effect of Supplementary Subsidies from Constructed Wetlands on Bat Activity
Student Author(s): Mason Ibrahim (Biology)
Faculty Mentor(s): Akira Terui (Biology)

Spatial subsidies create a nutrient exchange that maintains productivity and diversity in an ecosystem, which may aid in stabilization and lower extinction risks of consumers. As humans alter the landscape, these subsidy transfers are hindered; however, restoration of habitats may aid in reestablishing subsidy transfers. The restored habitat in our study is modeled by constructed wetlands. Development has severely diminished wetland habitats, which provide important ecosystem services, thus there has been a push to restore wetland ecosystems. This study analyzes the effects of additional subsidies in the form of emerging aquatic insects from wetlands on bat activity. Ten floating emergence traps were deployed once a month in three locations across the University of North Carolina Greensboro to collect aquatic insect emergence data from streams and wetlands. Bat detectors continuously monitored bat activity. The area with the highest bat activity was the site with a wetland and stream in the open habitat. The area with highest insect emergence was recorded in the stream site of the forested habitat. Results of this study will show the effectiveness of the restoration of habitats on strengthening subsidy transfers, which impacts the health of the overall ecosystem.

Three-Dimensional Models of Taphonomic Modifications to Bone
Student Author(s): Jessica Jacob (Anthropology)
Faculty Mentor(s): Charles Egeland (Anthropology), Anemone Robert (Anthropology)

Bone surface modifications (BSMs)— perimortem cut, tooth, and percussion marks on bones, are crucial in the identification of causal agents and the understanding of site formation processes. BSMs are key to understanding taphonomic history— all the events that occur between a once-living specimen's death and discovery. Thus, the analysis of BSMs plays a critical role in the interpretation of prehistoric fossil assemblages. Actualistic studies that utilize contemporary faunal assemblages are necessary for reconstructing past behavior accurately. This study combines an actualistic approach with CT, laser and light scanning, and photogrammetry to produce three-dimensional models of bovid long bones. These 3D models will be used to map the location of BSMs from bones butchered by humans and consumed by carnivores. A statistical analysis will then be conducted on the spatial distribution of these marks. This more objective methodology reduces researcher bias and misinterpretation. This research presents a case study of different three-dimensional modeling methods and their applications within a paleoanthropological context. We expect to be able to identify selective carnivore taxa from their tooth marks and the expertise level of butchers from their cut marks.

GWAS Analysis: Phenotypic response of Arabidopsis thaliana ecotypes to simulated microgravity
Student Author(s): Ben Jenkins (Biology)
Faculty Mentor(s): John Kiss (Biology)

The feasibility of long-term space exploration is contingent upon the sustainable production of water, oxygen, and food, which are all resources provided by plants. To determine which plants will remain most efficient in providing these resources, the level of stress in the plants caused by growth in a microgravity environment must be assessed. Wildtype genotypes of *Arabidopsis thaliana* were studied to investigate naturally occurring variation in gravitropic responses. The growth and development of plants grown in a randomized gravitational environment were measured and analyzed as indicators of the degree of stress experienced by different A. thaliana ecotypes in microgravity. 160 *A. thaliana* wildtype ecotypes were grown on a 2D clinostat to approximate the conditions of microgravity. By isolating the ecotypes that diverge from the typical response to gravitational stress, we can find those that are affected by a microgravity environment to a greater or lesser degree. Notably, several exceptional lines deviated significantly from the normal growth response, which indicated that they are more susceptible or resistant to the stress of microgravity. Identifying deviating ecotypes is an important step in determining how plants respond to microgravity and what makes them more tolerant to a spaceflight environment.

Investigating the Link Between Rates of Nitrogen Fixation and Legume Plant Traits in Longleaf Pine Savanna
Student Author(s): Amber Johnson (Biology)
Faculty Mentor(s): Sally Koerner (Biology)

The fire-dependent, nutrient poor, and biodiverse Longleaf pine (LLP) savanna ecosystem was once expansive across the landscape of the United States Southeast, covering about 92 million acres. However, due to anthropogenic pressures such as fire suppression, less than 2 million acres remain; therefore its restoration is of high conservation value. Legumes are plants in the Fabaceae family that are commonly found across fire-prone landscapes and can form a symbiosis with nitrogen (N) fixing bacteria, helping them to overcome nutrient deficiencies and return N to the soil, benefiting LLP. To utilize legumes in restoration, we must first understand the legume traits that are associated with varying levels of N-fixation. To address this, we collected 10 legume individuals belonging to 3 species (1 herb, 1 vine, 1 shrub) across 3 sites and measured leaf area and N-fixation. I hypothesized that the shrub would have the greatest leaf area because it fixed less N, meaning it had fewer resources, potentially causing it to have a larger leaf area in order to increase rates of photosynthesis.

What is the Impact of the Language We Use When Discussing Substance Use?
Student Author(s): Sarah Johnson (Psychology)
Faculty Mentor(s): John Sopper (Residential College)

Substance use disorder (SUD) is a growing medical condition in the United States but roughly 89 percent of individuals with SUDs do not receive treatment. What is the impact of the language we use when discussing substance use? While investigating this question, I utilized scholarly articles, online language guides, government memorandums, and other online sources to determine the effect of harmful language on social stigma and treatment of SUDs. I wanted to understand which specific terms are harmful, how large of an impact harmful language has, and if the 2015 terminology guidelines proposed by the ISAJE were helpful in combating stigma. I found that in general, person-first language such as “person with an SUD” and terms substituting “abuse” for “use” such as “substance use disorder” are less harmful. I also found that harmful language contributes to stigma and deters patients from seeking treatment and/or alters societal perceptions of the patient. ISAJE guidelines are consistent with terms found to be harmful and have slowly begun to decrease stigma. Discovering ways in which language may be harmful as well as techniques to alter our language in a positive direction is important, because it may impact the way SUDs are treated.

Spatiotemporal Deep Learning Model for Chromatin Tracking in Microscopy Imaging Data
Student Author(s): Sean Jung (Computer Science)
Faculty Mentor(s): Minjeong Kim (Computer Science)

Analyzing the movement of chromatin within cell nuclei provides valuable information in biological and clinical studies to understand disease mechanisms. However, due to inhomogeneous image properties and heterogeneous chromatin bead shapes and locations

across slices in microscopy imaging data, there have been limited studies to predict chromatin bead centers accurately and further infer the movement trajectories. To this end, this research proposes a spatiotemporal deep learning model to predict the location of the chromatin beads and analyze the trajectory of predicted location movements. Specifically, the spatial object detection is achieved by an improved Faster R-CNN (Convolutional Neural Networks) with bright spot attention features. The temporal component is modeled using a recurrent deep learning module, LSTM (Long Short-Term Memory), based on sequences of predicted centers. We evaluated the proposed model's accuracy using prepared training and testing data, and our model achieved outperformance over the basic CNN model-based predictions.

Communicating Wellness: Tacit Messages in Healthy Client Take-Home Literatures
Student Author(s): Rebecca Kefer (Social Work)
Faculty Mentor(s): Adams Heather (English)

In this project, I analyze documents—take home handouts and related websites— considering how they convey messages that persuade users to engage in activities that are framed as medically or morally imperative. Such messages might seem to be "self-evident" and/or objective to those who are prompted to engage them, but my research explains how they communicate problematic paradoxes related to the subjective and euphemistic wellness information given by a care provider to a client. I inductively code these documents to identify messages about wellness (what it is; how it "should" be maintained, etc.). Specifically, I analyze how these artifacts utilize measures of wellness (e.g. the body-mass index, weight, food consumption) that can reproduce norming and stigmatizing notions of wellness that are not culturally attuned or part of more dialogic approaches to patient self-efficacy(Derkatch). My research reveals how these documents include internal inconsistencies that undercut their intended purpose, reflecting the prevalence of the medicalized/BMI-forward approach to body size. At the same time, they include elements reflective of the cultural shift toward a reconsideration of the relationship between body size and health. These findings can be used to guide revisions of these documents, making them more rhetorically effective and culturally sensitive.

Isolation and functional characterization of iron-regulated transporter 1 (IRT1) in tef (Eragrostis tef)
Student Author(s): Christian Keith (Biology), Muhammad Numan (Biology)
Faculty Mentor(s): Ayalew Osena (Biology)

Iron is a vital micronutrient in human and plant health that is involved in processes like photosynthesis and cellular respiration. Iron is found in large quantities in the soil, but typically is insoluble. Plants have evolved two main strategies for iron uptake. Strategy 1 involves plants releasing hydrogen to convert Fe 3+ to Fe 2+. This strategy is used by non-grasses. Strategy 2 involves plants releasing mugineic acid to chelate Fe 3+. This strategy is exclusive to grasses. Previous studies have demonstrated that asian rice, a grass, contains the genes IRT1 and IRT2 which are necessary for strategy 1, proving that rice performs both strategies. Research into other grasses for the ability to perform both iron uptake strategies is of great importance to

prevent iron deficiency symptoms like anemia. The Ethiopian staple grain tef is an underutilized crop that has grown in popularity recently due to its high nutrient concentrations, with tef containing the highest amount of iron among the major cereal crops. Recent analysis in Dr. Osena's lab revealed that Fe deficiency induces a range of metal transporters in tef including IRT1. In this experiment, we intend to analyze IRT1 gene expression. We expect that the tef IRT1 encodes a functional iron transporter.

The authentic self, an exploration of gender in a broader social context.
Student Author(s): Nezar Khabirys (Library and Information Studies)
Faculty Mentor(s): Sara LittleJohn (Residential Colleges)

In this article, the author attempts to understand the characteristics of individuation and the context behind what defnes someone's gender expression. Research suggests that the factors are broad and dependent on the experience of the authentic self. This work supports the response to 'An alternative perspective: gender expression is a form of individuation and authentic self' by Karen Herdzik (2021).
This exploration draws evidence from literature and surveys, analyzing responses from a college demographic. The aim is to provide background information on the broad consensus of why people attempt to conform to societal norms. Some have attempted to cite psychological distress as a driving factor for conformity (Withers, 2020). The overall sentiment of Withers' work is negative, a survey conducted basing the questions on his rationale supports this. However, this paper attempts to draw evidence for Herdzik's defnition of gender, which posits that it exists as a form of individuation. To provide a point of cross-examination, a literary analysis of how people see themselves will be conducted using gathered data. This will include a look into self-identified involuntary celibates or "incels", as described by Daly and Reed (2019), in order to show how different interpretations of gender exist in hegemonic structures.

Social media's impact on rape myth acceptance and distress in college men
Student Author(s): Amanda King (Psychology), Faith O. Nomamiukor (Psychology)
Faculty Mentor(s): Blair E. Wisco (Psychology)

This study examines how the #Metoo movement (i.e., a social media campaign that challenged rape culture) and backlash against it (e.g., #Himtoo movement) affect men with and without a sexual assault history. Specifically, we were interested in the effects on distress and rape myth acceptance (RMA), or harmful attitudes about rape. This study recruited undergraduate men (N=132) to complete an online study using hypothetical Facebook feeds. Participants were randomly assigned to view one of three conditions that either promoted RMA (#HimToo), challenged RMA (#MeToo), or were neutral. We predicted a main effect of condition and an interaction between condition and sexual assault history, such that the #HimToo condition would have a larger effect for sexual assault survivors compared to controls. Findings showed no effects on RMA, but we did find a main effect of condition on distress and an interaction between condition and survivor status on distress. Specifically, we found that male controls felt significantly less distressed than male survivors when exposed to the condition that promoted RMA (#HimToo condition). Overall, findings suggest that men without a history of sexual assault victimization are more likely than male survivors, to feel better after viewing media that

promotes RMA.

Autistic Voices Are Essential for Authentic and Truthful Representations of Autism Spectrum Disorder (ASD) in Film and Television.
Student Author(s): Ella King (Art)
Faculty Mentor(s): Axel Battista (Education), Sara LittleJohn (Residential Colleges)

Most film and television works that depict autistic people lack accuracy and fail to characterize the autistic character in a way that feels humanizing and respectful. This is because these works were created by allistic writers, directors, and actors who lack a comprehensive understanding of ASD and how it presents in real people. If autistic people had the opportunity to help tell stories about autism, said stories would be more accurate. Stories shape our perception, and poor autistic representation gives allistic people inaccurate impressions of what autistic people can and cannot do; how they look, act, feel, and think. Most of my sources are analyses of autistic characters and stereotypes they fall into, found in books, articles, and essays. One particularly helpful source was a study titled "Hey look, I'm (not) on TV..." by Sandra Jones. I hope my research will highlight the importance of proper portrayals of ASD and convince readers that autistic people deserve to be in charge of how they are depicted. I will do this by comparing the verisimilitude of autistic characters created by autistic people with characters created by allistic people. I will also explain the negative impact of poor representation.

Effects of Ethanol extracts from Māmaki (*Pipturus albidus)* on TNF-α-Induced inflammation in Human Microvascular Endothelial Cells
Student Author(s): Grant Koher (Biology), Gabriel Suarez-vega (Biology)
Faculty Mentor(s): Zhenquan Jia (Biology)

Māmaki (*Pipturus albidus*), an Urticaceaea family nettle species endemic to Hawaii, has seen medicinal use by native populations for various conditions, including applications as an anti-inflammatory agent. However, mechanisms of action remain unclear. This study examined the effects and underlying mechanisms of māmaki on TNF-α-induced endothelial inflammation. We have screened six māmaki extracts (water, acetone, methanol, chloroform, ethanol, and ethyl acetate). Preliminary testing of different māmaki extracts showed that the ethanol fractions demonstrate inhibitory effects against TNF-α induced expression of Interleukin 8 (IL-8) and the chemokine (C-C motif) ligand 2 (CCL2) in human microvascular endothelial cells. IL-8 and CCL2 are two key mediators regulating endothelial inflammation. Using a luminescent assay to detect reactive oxygen species (ROS), our results showed māmaki ethanol extracts scavenge superoxide anions. This suggests that māmaki ethanol extracts may inhibit endothelial inflammation through ROS scavenging. The long-term goal of this project is to identify the major anti-inflammatory components of māmaki that regulate inflammation and their biological targets in the treatment and prevention inflammation-related diseases.

Enantioselective Tandem Deprotection-Cyclization of Alcohols to Form Lactones
Student Author(s): Sarah Korb (Chemistry)
Faculty Mentor(s): Kimberly Petersen (Chemistry)

In the pharmaceutical world, there are various beneficial molecules, and many of these

molecules contain a cyclic functional group called a lactone. Additionally, each molecule can have several different specific geometries while in some cases like Ibuprofen, only one confirmation of the molecule is active. In the process of making these molecules, some of the major problems synthetic chemists face are low yields and the inability to isolate just one isomer of the molecule. My research focuses on how to selectively make only one isomer of a lactone while reducing the number of steps it takes to reach the product. This is accomplished by taking a catalytic amount of a chiral acid and combining it with a protected alcohol to enable an efficient synthetic route that both deprotects the alcohol and cyclizes the molecule in one step. The ultimate goal of this research is to utilize this process on a much larger scale that can lead to increased yields and decreased prices in the preparation of potential drug type molecules.

Marriage Between Worlds
Student Author(s): Ernest Kroi (Art)
Faculty Mentor(s): Barbara Campbell Thomas (Art)

My paintings and drawings play matchmaker with wildly different subjects like chairs, cathedrals, and coral reefs. My intentional juxtaposition of subjects creates worlds of disjointed order. My goal is to invite viewers into these worlds that intentionally have a storybook quality. The storybook quality is evoked through impressionistic paint techniques used to create vibrant, lively, and unexpected characters and settings. Some of these stories are more imaginative while others are memories of my life loosely told visually.
In finding my subjects, I let images float into my mind like hot air balloons that collide with one another. When I like the relationship I see, I marry my subjects through carefully crafted details of the world that these subjects inhabit.
I feel as though when people grow up, they become more used to mundane reality and they leave behind the kid who looked out the backseat of the car and ran with their fingers to jump over trees. In my paintings and drawings, I aspire to make the mundane fantastic by bringing to life the phrase; “what if?” Through my old school self-expression, I hope to build the kind of worlds that make someone’s inner kid come out and play.

Inherited Toxicity: How the Legacy of Plastic Pollution Altered Future Generations’ Susceptibility to Emerging Chemicals of Concern
Student Author(s): Karabuning Kupradit (Biology)
Faculty Mentor(s): Ramji Bhandari (Biology)

Bisphenol A (BPA) has been used in plastic production since the 1930s, it has the ability to alter epigenetic gene expression causing developmental disorders. However, due to epimutations also occurring in the germ cells, the effects of BPA are passed down through multiple generations. Perfluorooctanesulfonic acid (PFOS) is an emerging chemical of concern also known to induce developmental disorders, however, it is widely used in the production of oil, water, and stain-resistant items. Therefore, while humans have inherited the effects of BPA from ancestral exposure, they are now additionally exposed to PFOS. However, no research has explored how ancestral BPA exposure affects the sensitivity to teratogenic phenotypes induced by PFOS exposure in current and future generations. Using medaka fish (Oryzias latipes), we compared two PFOS exposure scenarios. Group one had a history of ancestral BPA exposure while group

two had no history of exposure. The adult fish from both groups were then exposed to environmentally relevant concentrations of PFOS. During this time, their embryos were collected, reared with no chemical exposure for one month, then photographed to observe phenotypic malformations. Our preliminary results suggest that a history of ancestral BPA exposure can increase sensitivity to developmental defects in children following parental exposure to PFOS.

The Intersection of Material Culture and Mortality: Assessing Ethnic and Social Differentiation in the Tombs of Yaracachi Cemetery, Peru
Student Author(s): Jessica Linn (Anthropology and Archaeology)
Faculty Mentor(s): Donna J. Nash (Anthropology)

Humans have a variety of means of coping with the inevitability of death that is expressed in material culture. To interpret burials as the material remains of ritualistic processes, multiple variables need to be assessed, such as the construction, location, spatial distribution of graves, and associated grave goods. Two types of tombs were uncovered at the Yaracachi cemetery in Moquegua, Peru; round tombs and rectangular tombs. Rectangular tombs were atypical in the Andes during the Late Intermediate Period (1100-1400 CE). For this project, I plotted graves based on shape and elaboration to discern spatial patterns and assessed the types and numbers of associated cultural materials to consider ethnic affiliations and social status. I analyzed grave data from 107 units (approximately 22% of the 12,500 sq meter cemetery). Rectangular-shaped graves account for only five percent of the graves examined. I found that rectangular graves occur in clusters, which may indicate an association between these individuals, perhaps based on social status or ethnicity. The rarity of rectangular graves at Yaracachi and throughout the Andes suggests that these are high-status graves. The rectangular graves have a higher average number of grave goods and metal artifacts than round tombs, which further supports that these graves display a higher socio-economic status of the interred individuals.

Undergraduate Experience Levels and Interests in Public Health Research
Student Author(s): Tamaya Long (Public Health Education), Callie Annas (Public Health Education), Albar Arvizu Contreras (MPH in Public Health)
Faculty Mentor(s): Michelle Martin-Romero (Public Health Education), Sharon Morrison (Public Health Education), Sandra Echeverria (Public Health Education)

Undergraduate engagement in research is a high-impact learning strategy that builds competencies for the public health workforce. Unfortunately, many undergraduate students complete their bachelor's degrees without research experience. Further research is needed to better understand the current student experiences and perspectives.
The objective of the study is to educate and help PHE students to experience research hands-on in a community setting alongside faculty that has adequate knowledge of research. Having this course will help students experience what research looks like in a community setting and help students gain adequate knowledge that could be used later on in their careers.
This study uses an electronic survey developed by a team of undergraduate and graduate students and faculty members. The survey consists of # items to assess students… X(#)

undergraduate students located in central North Carolina will be invited to participate in the survey.
The quantitative data gathered from this survey will be using frequencies, means, and other statistical tools. The data will be analyzed using Google forms and SPSS.
The findings gathered from this survey will inform the development of a community-engaged research initiative for undergraduate students majoring in Public Health so faculty can engage and better meet the needs of the UNCG students.

Cause and Effects of Weight Gain in College Students: The Source and The Solution
Student Author(s): Abigail Lowry (Media Studies)
Faculty Mentor(s): Sara LittleJohn (Residential Colleges)

College students' physical health typically declines starting their freshman year. This is commonly known as the "Freshman 15". Most students are finding it difficult to consistently make healthy living decisions. This is directly affecting their mental, emotional, and physical health. College age students are struggling with excess weight gain due to lack of information and access to healthy eating. I argue that colleges are not providing enough healthy living options combined with a lack of knowledge surrounding healthy living is causing generations of unhealthy students, resulting in a cycle of unhealthy living.
While using data from a survey of students to show what factors they believe are causing this. By sources such as the peer reviewed article *Factors that predict weight gain among first year college students* and the book *Exploring the Concept of the "Freshers' 15"* to conclude that students are gaining weight because of lack of motivation, few healthy food options, and ignorance of what healthy living is. This research will discuss the factors that students see contributing to their weight increasing and what science says, as well as ways to improve physical health.

Lessons learned: how to conduct culturally appropriate study with Latina mothers
Student Author(s): Diana Marcos Rosas (Nutrition), Luz Villa (Nutrition), Kristen McElhenny (Nutrition)
Faculty Mentor(s): Jigna Dharod (Nutrition)

The Latino group is the fastest growing population in the U.S. but are highly affected by health disparities. To improve the reach and involve this population in research and programs, it is critical to develop culturally appropriate methodologies and instruments. Hence, the main goal of the study was to translate and develop culturally appropriate survey instruments for Latino mothers of young infants. The study also involved developing recruitment methodology to ensure high recruitment and retention of Latina mothers in 6-week post-partum study involving home visits to carry out home food inventory and collect breastmilk sample at each visit. In case of home food inventory, review was conducted to identify different grains, vegetables, fruits, and snacks that were popular among Latino community. Based on the literature review and content validity, several items were added in each food categories to make the food inventory applicable for Latino households. For other English validated scale, post-Spanish translation, the scales

were reviewed by Latina mothers to adjust cultural and language nuances and preferences. In conclusion, preliminary step of conducting content and face validity with study population of interest is critical in ensuring high participation of immigrant and minority families in the research study.

Epitranscriptomic Variations in Different Phases of Cell Growth
Student Author(s): Elizabeth Martin (Chemistry), Vienna Tang, Frank Morales-Shnaider, and Hongzhou Wang
Faculty Mentor(s): Norman H.L. Chiu (Chemistry)

There are growing interests in studying the role of RNA modifications within a specific epitranscriptome. To obtain pure and sufficient starting materials, the most common practice relies on culturing suitable cell lines and follows by extracting RNA from the cell cultures. Depending on the type of study as well as the endpoint measurements for RNA modifications, the required number of cells in each experiment may vary significantly. Furthermore, with the same cell line, the rate of cell growth may change under different culturing conditions. To ensure any variations on the level of RNA modifications are not artifact from harvesting the cells at different points of time during the cells are being cultured, the goal of this project is to determine whether there are any epitranscriptomic variations in different phases of culturing a specific cell line. In general, based on the growth rate, a cell culture would undergo three different phases: initial incubation, exponential growth, and stagnation. By using Thermus Thermophilus as our cellular model and analyzing its epitranscriptome with an established mass spectrometric method in our lab, 17 different RNA modifications were detected. Only 24% of the epitranscriptome was found to remain at a constant level despite the cell culture undergoing different phases. For the rest of the epitranscriptome, 59% of those modifications were detected at higher levels (up to 188%) after the cell culture entered the exponential phase. The findings of our study imply any future epitranscriptomic studies should include extra controls from harvesting the cellular samples at different time points.

Use of Public Data to Advance Health Equity
Student Author(s): Miroslava Martinez (Public Health Education), Stefanie Vidal (Public Health Education)
Faculty Mentor(s): Sandra E. Echeverría (Public Health Education)

The social determinants of health (SDH) are defined as, "… the conditions in which people are born, grow, work, live, and age, and the wider set of forces and systems shaping the conditions of daily life…" More specifically, the Built Environment (BE) represents the physical (e.g., neighborhoods) and natural environments (e.g., parks) that can promote health. In the present study, I gathered information on the Built Environment from publicly available data sources for Guilford and Alamance County. I collated data from the Guilford County Community Health Assessment 2019, Alamance County Community Health Assessment 2021, the ParkServe website, and neighborhood-level walkability measures to create a list of Built Environments factors in these counties. These BE factors were added to a "How-to Guide" for community members to use for advocacy and program planning. I am working on a website where all of these measures will be made accessible to community leaders and residents.

What are the different effects of intervention-based attendance policies and punitive attendance policies?
Student Author(s): Talibah Matsimela (Teacher Education and Elementary Education)
Faculty Mentor(s): John Sopper (Residential Colleges)

As school officials recognized the direct correlation between school attendance and school performance, counties and school districts implemented more explicit guidelines and regulations, also known as attendance policies, in an effort to reduce truancy and absenteeism. Some of these polices are punitive and emphasize punishments. Others are intervention-based and center on finding and addressing the root of the problems that keep children out of school. My research set out to discover whether or not punitive policies based on consequences and punishments are more or less effective than intervention-based attendance policies. My research included reviewing academic journals about truancy and chronic absenteeism, as well as familiarizing myself with the policies of Guilford County Schools and comparing them to those I found within case studies and gauging the effectiveness of both. I consider this an important topic to research because I plan on becoming a teacher in my future, and I'm passionate about social justice issues and analyzing systemic inequities. If punitive-based attendance policies are simply punishing children without improving their school performance, then they should be reevaluated and replaced by other means of regulating attendance such as intervention-based policies.

Why is it Hard to Change Behaviors that Contribute to Ocean Pollution?
Student Author(s): Rosario Maza-Valadez (Biology)
Faculty Mentor(s): John Sopper (Residential Colleges)

5.25 trillion pieces of plastic debris are currently in the ocean and there are currently eight billion people living on our planet and throwing away more and more trash every minute. Obviously, this cannot continue without destroying the oceans and all life as we know it. But we continue to purchase and leave trash where it does not belong, even though we know to an extent what damage pollution is causing in the ocean. So, my research asks why is it so hard to change behaviors that contribute to ocean pollution. To answer this question I examined the different kinds of impact ocean pollution has on marine life, and human health, and what are the first steps we can take. I found different opinions about how ocean pollution should be handled, how human life is affected, how marine life is affected, and what we can do to change our ways. Answering my research question helps individuals understand what is happening in the ocean, and how it affects them, and it will also encourage them to live a more sustainable lifestyle.

Monstrous Memories: How Does Horror Reflect Culture?
Student Author(s): Eddie McGlothlin (History)
Faculty Mentor(s): Sara LittleJohn (Residential Colleges)

When I started Capstone I knew I wanted to write about horror, more specifically I wanted to better understand: can monsters in horror media teach us about the culture they were made in? In my research I have already found several amazing sources including the book Monstrous Nature by Robin L Murray and Joseph K Heumann which covers in detail the cultural influences of kaiju in particular. There were a lot of similar books and articles that I know will help, but in

the case of the films I'm covering I also have the opportunity to study interviews with the creators themselves which will be valuable primary sources. There are several examples of horror embodying the cultural anxieties of their creators. Looking back at kaiju, the creators of Godzilla have stated on multiple occasions that their giant, radiation breathing lizard was a direct allegory for the destructive power of the Nuclear bomb- a allegory given even more power when you remember that the first Godzilla movie came out just over a decade after the bombs were dropped on Hiroshima and Nagasaki. As another example Zombies and vampires are an incredibly versatile monster in film, whether they stand in for consumerism in films like Dawn of The Dead or queerness in stories like Carmilla and Interview With a Vampire.

Why is Biohacking becoming so popular, specifically when it comes to wearable devices?
Student Author(s): Annica McLean (Computer Science)
Faculty Mentor(s): John Sopper (Residential Colleges)

Biohacking has become a massive buzzword, especially when it comes to wearable technology. I wanted to find out why. So the question I asked was why is biohacking becoming so popular, specifically when it comes to wearable devices? The sources I used to find the answers to my question are journal articles, websites, and chapters of books. What I found is that many people use wearable devices for health reasons. I also found that many employers use them to create more efficient employees. By watching their employees every move, like seeing when someone takes a break, these companies hope to increase their workers' productivity. Wearable devices are also used to harvest big data. Something else I found was that using wearable technology may cause you to focus your self-worth on the numbers reported by your device, leading you to not trust yourself. Exploring my research question is important because wearable technology is becoming a more integral part of our everyday lives, and so it is important to know the benefits and disadvantages.

What Are You Doing?
Student Author(s): Lily McQuilen (Theatre)
Faculty Mentor(s): Roberto Arce-Martinez (Theatre)

What Are You Doing? is an exploration of the concept of willful ignorance and the bystander effect in our global society. Rooted in the presence of a human body, the piece combines mediums of film, projection, soundscape design, and theatrical performance. Presented in video format, projected on a wall, the viewer becomes a part of the exchange. The piece is underscored by news footage following the February 2022 UN IPCC report and CBS' "MoneyWatch", demonstrating the ever-growing threat of climate change and the capitalist system that advances our own destruction. Integrated into a cacophony of natural sounds, juxtaposed with their man-made equivalents; the sound of a wildfire, the flick of a lighter, the soundscape exhibits the noise of our world. The subject sits, unmoving, in the center of a room as a slide projector methodically advances through images of natural disaster onto and behind them. The subject does not see the images filling the wall behind them. Instead, they sit, unmoving. '*If only they would just turn around.*' This piece questions our shared passivity as humans and brings into question the responsibility we each have as individuals in upholding our own systems of destruction.

Associations Between Subjective Thirst Ratings with Energy Intake following Sleep in Hot and Temperate Conditions
Student Author(s): David Messer (Kinesiology)
Faculty Mentor(s): Jessica McNeil (Kinesiology)

BACKGROUND: Mixed findings on associations between subjective thirst perception ratings with energy intake (EI) have been reported, however, the impact of sleeping in a hot versus temperate environment on subjective perceptions of thirst and ad libitum EI following waking has yet to be fully explored. This study investigated differences in thirst perception following sleep in hot versus temperate environments, and whether differences in thirst perceptions are associated with ad libitum EI the next morning. METHODS: Ten healthy adults (females n = 1; age, 25±4 y; height, 177.9±7.4 cm; body mass, 75.8±13.8 kg; body fat, 13.5±7.1%) participated in a randomized crossover study where they slept overnight in an environmental chamber, set at 25°C, 30% RH (TEMP) or 30°C, 30% RH (HOT). Feelings of thirst sensation, thirstiness, pleasantness, dryness, taste, fullness and sickness upon awakening were measured via visual analogue scales and assessed by delta change between conditions. The breakfast consisted of different food and beverage items that were self-selected by participants. Paired samples *t*-tests evaluated between- trial differences in perceptions of thirst and EI. RESULTS**:** There were no statistically significant differences in fasting perceptions of thirst upon awaking, EI (TEMP: 627±330 vs. HOT: 736±81 kcal; p=0.168), carbohydrate (TEMP: 25±13 vs. HOT: 28±13 kcal; p=0.401), fat (TEMP: 76±43 vs. HOT: 87±33 kcal; p=0.313), and protein (TEMP: 24±22 vs. HOT: 30±16 kcal; p=0.221) intake between conditions. Greater perceptions of thirst prior to breakfast were associated with greater carbohydrate intake during breakfast (p=0.003). Delta fasting perceptions of thirst were not significantly associated with delta energy, carbohydrate, and protein intakes (p>0.05). CONCLUSIONS: No differences in perceptions of thirst and EI were noted between conditions, although greater waking perceptions of thirst were associated with greater carbohydrate intake during breakfast. An increase in thirst upon awakening may lead to greater consumptions of carbohydrates at breakfast and further studies should explore this interaction as a determinant of overall caloric consumption.
Grant or Funding Information: This study was funded in part by Bedgear, LLC.

The Lion, The Jackal, and The Man
Student Author(s): Zaire Miles-Moultrie (Marketing, Entrepreneurship, Hospitality and Tourism, Art)
Faculty Mentor(s): Jennifer Reis (Art), Christopher Thomas (Art)

Learning about Africa, its people, cultures, history, its reach and its effects across the world is not an easy task to do but once you start it's almost impossible to stop. As an artist it is a wonderland that I enjoy exploring and taking what I learned and transforming it into works of art. This is an experience that I am so glad and appreciative to have however, while learning about the wonders of Africa I also had learn about the terrible beauties, misconceptions, perversions, abuse, and other heinous aspects that Africa and its people had to endure from Western Nations /Colonizers and from within. From this comes The Lion, The Jackal, and The Man a solo art exhibition that explores the cultures, histories, and peoples within Africa. The works in The Lion, The Jackal, and The Man is a direct acknowledgement of the beautiful, the

good, the bad, and the inconceivable of the history and cultures within Africa.

The Warrior Mentality Scale: Initial Psychometric Properties, Exploratory Analysis, and Mental Health Correlates in a U.S. Veteran Sample
Student Author(s): David Miller (Psychology)
Faculty Mentor(s): Kari Eddington (Psychology)

We examined the structural and psychometric properties of the Warrior Mentality Scale (WMS-12) in a sample of 260 U.S. military veterans. Results of an exploratory factor analysis revealed best fit from a single factor, 12-item structure targeting cognitions, perceptions, and behaviours aimed at anticipation of threats in an individual's environment. Psychometric analysis revealed excellent internal consistency for WMS-12 items (α = .920; ω= .919) and validity evidence showed significant correlation between WMS-12 scores and industry standard measures of anxiety (r = .588), stress (r = .569), anger (r = .548), and emotion regulation (r = .510) (all p's < .001). A convenience sample of 271 undergraduate students was utilized to examine mean differences in WMS-12 scores between veterans and non-veterans. T-test results, adjusted for non-homogeneity of variance showed significant group differences [t (390.45) = 7.075, p < .001], (Hedges' g = .653). These findings provide initial evidence supporting the influences of training in preparation for combat and military service on servicemembers self-regulation post-service.

The Science Fiction Abundance
Student Author(s): Corban Mills (Psychology)
Faculty Mentor(s): Maura Heyn (Classical Studies)

The Science Fiction Abundance is a book of poetry that documents almost all corners of the science fiction genre. Science fiction allows for individuals to make the unfamiliar familiar. By this, it is meant that science fiction takes complex philosophical and existential ideas and places them in a story in a way where people can understand these ideas. Science fiction has the opportunity of placing the reader in a world that they could possibly live in someday, thus placing them in an unfamiliar world that has familiarity. This paradox creates cognitive dissonance, striking thought and fear into the reader's mind. Science fiction, in my work, is used as a warning for what could possibly happen in the future, what has happened in the past that is covered up, and what could possibly be happening in the present that we are not aware of. I use poetry to express these ideas due to the innate nature of poetry capturing the feelings and imaginations of those who read it. Poetry also involves meter and manipulation of words which, in itself, can reflect on many science fiction ideas creating an experience for the reader that is more than just a story.

Alleviating Food Insecurity through the Free Farmers Market in Greensboro
Student Author(s): Felyssa Karla Mills (Environmental and Sustainability Studies)
Faculty Mentor(s): Plaxedes Chitiyo (Environmental and Sustainability Studies)

This research project examines food insecurity in Guilford County, focusing mainly on Greensboro farmer's markets providing resources for people in areas that lack access to healthy

and affordable food. Approximately 70% of Guilford County's food deserts are concentrated in Greensboro. Different farmer's market models, such as the Free Farmers Market in New Garden Park and the Out of the Garden Fresh Mobile Market, demonstrate whether these models are sustainable and applicable in other areas of North Carolina, where nutritious food has limited accessibility. The research was conducted through direct involvement and interaction with farmers and directors of the market through volunteering at the free farmers market events that ran from October to November 2022. Data collected includes farm operations providing food at the market and the area zip code of consumers. The Fresh Mobile Market hosted by the Out of the Garden Project also provides free fresh food and shelf-stable items to areas in need will also be examined. Results show community is a common theme throughout the different market models. Community plays a fundamental role in relieving food insecurity in impoverished areas. While the idea of a free farmer's market may temporarily alleviate affordability issues, some areas in the model, such as transportation, still need improvement.

Changes in General Joint Laxity and Progesterone Levels across the Female Menstrual Cycle.
Student Author(s): Tala Najjar, Senior (Public Health Education)
Faculty Mentor(s): Sandra Shultz (School of Health and Human Sciences)

Background: Females on average have greater joint laxity than males, defined as looseness of the joint, due to many factors (i.e., anatomic differences, hormones), which places them at a greater risk for knee joint injury. Progesterone is thought to influence knee laxity. Progesterone levels change across the menstrual cycle and greater concentrations are thought to be associated with less joint laxity. The aim of this study is to explore the relationship between progesterone levels and general joint laxity (GJL).
Methods: 70 females, with normal menstrual cycles (26-32) days for the past 6 months were tracked for 1 menstrual cycle. GJL and progesterone were measured each morning during the first 6 days of menses and then again for 8 days post ovulation. These females were non-smokers, recreationally active and had no history of knee injury. Restrictions prior to data collection included no alcohol 24 hours prior testing.
Plan for analysis: Secondary data analysis using an Analysis of Variance(ANOVA) to determine the difference in the average progesterone level and the average general joint laxity in the follicular and luteal phases of the menstrual cycle.
Discussion: Results will inform our understanding of the cyclic changes that occur in progesterone levels and how they impact GJL, a known risk factor for knee injury.

The Control and Discipline in Hephzibah Baptist Church
Student Author(s): Abigail Napier (Political Science)
Faculty Mentor(s): Dana Logan (Religious Studies)

In the antebellum American South, Baptist churches served a larger purpose than sharing the gospel. For many, Baptist churches were an additional measure of control, discipline, and morality for their members. Dr. Dana Logan of the Religious Studies Department has been researching the realities of discipline in Baptist churches with my assistance. Throughout this year, I have focused my research on the Hephzibah Baptist Church in North Carolina. Using the

minute book for the antebellum period and a spreadsheet I created, I have been keeping track of all the new members from 1810 through the 1850. By noting their membership, I have been able to explore particular patterns in the relationship between enslavers and people they enslaved. One of the most notable patterns in relation to Dr. Logan's overall research is that many enslaved people joined Hephzibah before their enslaver did, but only after members of the enslavers' family had already joined. In some cases, as many as twenty-seven people who were enslaved by the same person joined before their enslaver did. This suggests that enslavers used the Church as a tool of control and discipline over the people they enslaved.

The Looking Within: How does UNCG Understand Hunger?
Student Author(s): Cathy Nicholson (Public Health Education), Aliyah Bryant (Public Health Education)
Faculty Mentor(s): Meredith Gringle (Public Health Education)

There are many students facing hunger at UNCG, mainly due to the proper and lack of promotion of available resources. Many students are placed at a disadvantage apropos to the negating societal definition and barrier placed around what truly defines food insecurity or someone who is food insecure. For our research we have developed a food map to serve as a tool to help students understand the production and distribution of food in the area surrounding UNCG. The food map will focus on three main factors: Various food options and their locations, The accessibility of those options to students at UNCG. Prices/acceptances of SpartanCash or meal swipes. Suggestions for improving food access within the UNCG community will be offered.

How the Punk Movement Came to House so Many White Supremacists
Student Author(s): Christian North (Media Studies)
Faculty Mentor(s): Sara LittleJohn (Residential Colleges)

Punk as a counter-culture movement often had a "offend everyone possible" approach to countering mainstream culture, this included lots of white supremacy imagery such as swasticas and SS symbols. This made it so that people who genuinely follow white supremacist ideals could participate in the movement and eventually form their own dedicated subsection. I am someone that grew up around punk music and would also join in punk culture and go to local punk shows in my hometown. I believe in a lot of ideals held by most punks but I am very saddened by the fact that I have to share punk with so many who have such harmful ideals, so I want to know how they found a place in punk. I plan to use sources such as "Skinheads Shaved for Battle" by Jack Moore to analyze how white supremacists formed a space in the punk scene. I hope this research will help shed light on how white supremacy can spread within movements and also help to show a clear separation between white supremacists and many others in the punk scene that are very against white supremacy.

The Cultural History of UNC Greensboro, and the Responsible Parties in its Founding
Student Author(s): James Ojudu (Teacher Education and Higher Education)
Faculty Mentor(s): Sara LittleJohn (Residential Colleges)

The Ashby Residential College (ARC) was formed in 1970, and since its inception has been noted for a liberal and accepting culture, however we must ask the question of how this culture formed. Was it a natural consequence of the College being in the wider environment of a university or a result of the machinations of the administration? Knowledge of who is responsible for the culture of the College is valuable because it gives context to the atmosphere of the college over time and allows students and faculty to look critically at the future actions taken and traditions followed by the college. Through this investigation certain texts will be used such as "Importing Oxbridge" to discover more about the first attempts to import the Residential College concept to the United States, interviews with alumni and administration of the ARC to discover perspectives that are less likely to have been recorded, and Archival Data to discern from what survives how the ARC developed through the written record. This paper will argue that the ARC culture is a result of the influence of administration, the grassroots efforts of students, and the inherent nature of the university environment.

Shelter
Student Author(s): Isabelle Parris (Art)
Faculty Mentor(s): Lee Walton (Art)

This assignment from my Time-Based Media class was inspired by the work of conceptual artist, Francis Alys' work *Painting/Retoque*, in which the artist retouches a faded dividing line on the road alongside the Panama Canal. My task was to make a short film "improving a public space." My aim in building this shelter was to provide a place for neighborhood kids to play, explore, and create as I once did myself growing up on a farm in Louisiana. My appreciation for nature was instilled from an early age and stays with me to this day. I used only fallen branches in order to preserve the natural growth and to not disrupt any wildlife. Although I went in with a plan, the act of both building and filming at the same time required improvising and adapting to the environment as I worked. In a world dominated by screens, where we are increasingly disconnected from nature and each other, it's important to find a way to ground ourselves back to the Earth. I've come to realize that the process of creating this work was just as, if not more, important than the final outcome. To my delight, the day after construction, I found two boys adding on to the shelter, adopting it as their new club house.

Strain and Growth Condition Studies to Enhance the Production of Verticillin A and Verticillin D
Student Author(s): Devyani Patel (Chemistry)
Faculty Mentor(s): Nicholas Oberlies (Chemistry)

Verticillin A and verticillin D are fungal metabolites that are highly cytotoxic (nM) against cancer cells, making them drug leads for cancer treatment. Being that we have access to a library of fungi that produce these compounds, the goal of our project was to determine which strains of

fungi and growth conditions were ideal for the highest production of verticillin A and D. This would allow for the extraction and isolation of gram-scale quantities of the compounds. To do so, five fungal strains were assessed for verticillin production. Of those, strains, MSX59553 and MSX51257 were the best producers of verticillin A and verticillin D, respectively. Then, these two fungal strains were grown on rice and oatmeal to compare the production on different media. The results showed that the oatmeal media induced a higher production of the verticillins as compared to rice, making it the better solid media for large-scale cultures.

The Fallout of Non-fungible Tokens (NFTs)
Student Author(s): Vishva Patel (Mathematics & Statistics)
Faculty Mentor(s): Sara LittleJohn (Residential Colleges)

NFTs have been a controversial topic gaining traction in the past decade. NFTs are digital tokens created on a blockchain that cannot be replicated but can be traded for money or other NFTs. They most commonly are used to represent artwork, but can also represent music, real estate, etc. However, purchasing an NFT does not give the buyer actual ownership of the object. Most NFTs are generated with the Ethereum blockchain, a database with a massive carbon footprint. Energy production factories to generate NFTs also impact local business owners and residents by creating noise pollution and increasing energy bills. As someone pursuing a computer science minor and having conducted previous research on sustainable infrastructure, I aim to inform readers about the fallout associated with NFTs. By using sources such as *The Bitcoin Dilemma: Weighing the Economic and Environmental Costs and Benefits* by Colin Read, articles from the Journal of Responsible Technology and Current Opinion in Environmental Sustainability, anecdotes and surveys, I argue for the decreased implementation of NFTs and conclude that the benefits are not enough to overtake the detrimental effects. The impact of energy consumption needed to produce NFTs combined with the current state of the environment and rising costs of living renders NFTs unsuitable for wide-scale use in the present day, thus they should not be created nor traded unless absolutely necessary.

Cultural Capital: The Effects of Cultural Institutions and Philosophies on Indigenous Economic Development and Outcomes
Student Author(s): Lillian Pauca (Information Systems and Supply Chain Management)
Faculty Mentor(s): John Sopper (Residential Colleges)

My research project applies the concept of cultural capital to understand the economic development and outcomes of North American Indigenous communities in the current American economy. My research methodology includes consulting multiple databases, academic journals, and websites for relevant economic and statistical data and information about topics such as the meaning of cultural capital, which cultural capital is most rewarded in the American economy, and what are the primary forms of cultural capital emphasized and rewarded among Indigenous peoples in North America. Through this research I found that the collectivist cultural philosophies often associated with Indigenous cultures are a late and distorted development in Indigenous history. Despite being a late development, these collectivist philosophies constitute a form of cultural capital that shapes tribal institutions, business practices, and

entrepreneurship patterns among some Indigenous communities in ways that contribute to high poverty levels. However, I also find that cultural capital alone does not fully account for indigenous economic development and outcomes. Land tenure legislation and other forms of US government policy towards Indigenous peoples also contribute.

Antioxidant Properties Among Common Grains
Student Author(s): Willy Piña (Biology), Tyler Graff (Chemistry and Biochemistry), Anastasia Romanov (Biology)
Faculty Mentor(s): Ayalew Osena (Biology), Zhenquan Jia (Biology), Nicholas Oberlies (Chemistry and Biochemistry)

It is understood that grains are a great source of fiber and various nutrients, but recent studies are showing that grains have antioxidant properties as well. The question at hand is which grain among all the common grains gives the most antioxidant response. Studies in have shown that brown tef has lots of flavonoids that take part in antioxidant responses; this means brown tef has higher antioxidant properties even when compared to its ivory tef counterpart. Though brown tef has higher antioxidant properties than ivory tef, it is necessary to understand how brown tef compares to other more common grains such as corn, rice, and wheat. The expectation is that brown tef and ivory tef will have higher antioxidant activity compared to all the other grains. Flavonoids are also linked to the coloration of the tef seed therefore brown tef is expected to have the most antioxidant activity due to its darker color which would correlate to higher flavonoid content. In this study, we are preparing extracts from tef, wheat, rice and maize grain and testing their antioxidant activities based on glutathione (GSH) level in THP-1 monocytes. Our preliminary findings show a slightly higher GSH level in brown tef extract than that of other major grains. Studies are ongoing to further characterize the antioxidant activity of the extracts. This new information can set a new standard for common grain consumption, meaning tef could be the replacement for wheat or maize. Tef could be used nationwide leading to healthier individuals and maybe even lower overall numbers of cancer cases.

Polarization in the Modern Congress
Student Author(s): Ethan Pinkey (Political Science)
Faculty Mentor(s): Sara LittleJohn (Residential Colleges)

I'm analyzing partisanship in the US Congress and how it impacts Congress' effectiveness. Since the decrease in strong committee government and regular order, there has been an increase in strong Congressional leadership and partisan loyalty among rank-in-file members. While polarization doesn't have a single cause, Political Scientists such as Barbra Sinclair from the University of Oklahoma have been able to trace it back to a few defining moments. Defining moments in our history, like the radicalization of the Republican party, the increase in landslide counties, polarization in the activist base of both parties, and the presence of conditional party government have all been factors in the polarization of Congress. A key change I will talk about is how the realignment of the South has changed Congressional polarization. Issues like the 1964 Civil Rights legislation, partisan redistricting, and Barry Goldwater's failed Presidential Election led to a reorganization of electoral politics in the South and put an end to the so called "Conservative Coalition" of Republicans and Southern Democrats. I'm interested in this topic,

as a Political Scientist, because I believe polarization accounts for a lot of Congress and the Federal Government's shortcomings. I believe that by better understanding polarization and its effects, we can adjust the way we perceive Congress at least.

Strategy Depth and the Testing Effect
Student Author(s): Nathan Pressley (Psychology)
Faculty Mentor(s): Peter Delaney (Psychology)

This paper examines the role of participant's encoding strategy as well as strategy change and its relationship with the testing effect. The testing effect refers to the reduction in the build of proactive interference after taking free recall tests. This study used a list learning design where 120 participants learned 3 sets of 20-word lists with half given free recall tests (test condition) between lists while the other half were not (no test condition). All participants were then given a final recall task and asked to report the strategy, or strategies, that they utilized during memorization. The testing effect was replicated, however when controlling for strategy depth it was eliminated. This could be due to a significantly larger proportion of individuals in the testing condition using deeper encoding strategies compared to those in the no test condition. Participants in the test condition that used shallow strategies had no testing effect. Indicating that the testing effect may be dependent upon strategy depth. More information on this area must be conducted to determine why participants in the test condition are much more likely to choose a deep encoding strategy, and how this interaction contributes to the testing effect.

Retelling the Life of Grace Sherwood: Exploring the Process of Playwriting
Student Author(s): Amabel Prisk (Theatre)
Faculty Mentor(s): Janet Allard (Theatre)

Retelling the Life of Grace Sherwood; Exploring the Process of Playwriting will examine the process of developing my first full length play script, *Retelling the Life of Grace Sherwood*. Nearly two years in the making, *Retelling the Life…* began with a newspaper article from an October issue of a local paper recounting the story of Grace Sherwood, the last woman to be tried for witchcraft in American history. Fascinated by Sherwood's story and many questions left unanswered, this newspaper article would become a catalyst for a playwriting process that would span the remainder of my college career. Nearly two years in the making, *Retelling the Life of Grace Sherwood* has provided me with the opportunity to build creative relationships within UNCG's School of Theatre, conduct creative and historical research, experience the process of new work development, and partake in the Lloyd International Honors College Student Artist in Residence Program. Following two timelines–one past, one present–*Retelling the Life* explores Sherwood's life and legacy, with themes of reclamation, identity, feminine power, intergenerational connection, and Queer love. How can injustices of the past be reflected/disguised in a modern context? How does history repeat itself? Where is the line between celebration and appropriation? What does it mean to reclaim the past? This presentation will outline the evolution of *Retelling the Life…* , the play's historical context, and my experience navigating process-based creative inquiry in a product-oriented culture.

AI Art Is a Promising Tool of the Future When Use and Response is Regulated Morally and Practically
Student Author(s): Kierra Rainey (Nursing)
Faculty Mentor(s): Sara LittleJohn (Residential Colleges)

As the controversy of artificial intelligence, henceforth referred to as AI, has made waves in the creative space of the arts, a conversation needs to take place discussing the appropriate handling of AI art. Lately, it has especially made waves with programs allowing widespread use of the phenomenon and in my research project I will cover how this has affected online communities. Producers and consumers can form a positive, optimistic perception of AI whilst regulating it in a way that maintains civility with each other. I am interested in this subject because as a content creator I have noticed division, disapproval, and displeasure when it comes to those who use AI art. The use of AI art can be fairly disdained, but we need to ensure that use of AI is both morally, and practically, acceptable to anyone in this space. My search has been guided by journal articles and books such as Painting in the Age of Artificial Intelligence; furthermore, my research will be additionally swayed by an upcoming interview with an art student. These findings will lead to an argument in which AI art can be used proficiently, not to the detriment of others, but with respect towards people's boundaries and interests.

A Comparison of Athletic Performance Across the Menstrual Cycle
Student Author(s): Jamie Raymond (Nutrition)
Faculty Mentor(s): Sandra Shultz (Kinesiology), Jessica Dollar (Kinesiology)

VO2 max measures aerobic capacity and cardiorespiratory fitness. Information on VO2 max across the menstrual cycle is valuable information for health and fitness. Existing literature is mixed, and few studies employ the necessary rigor.[1]
This study aims to identify if exercise performance changes across the menstrual cycle.
Twenty active females (ages 18+) who were recruited for a broader study are included. The participants menstruate regularly and exercise 150+ minutes each week. VO2 max tests measured oxygen consumption. Participants completed testing during the early follicular, late follicular, and mid-luteal phase of their menstrual cycles. The VO2 max/peak, duration, heart rate, and respiratory exchange ratio of each participant were measured.
A repeated measures analysis of variance will be used to address the study aim. Because of the decreased estrogen levels correlating with a slight decrease in performance during the mid-luteal and early follicular phase compared to the rest of the cycle is hypothesized.
Results will inform menstrual cycle impacts on female athleticism.

Perchlorate-induced Molecular Alterations in the Testis and Fertility Defects in Male Medaka Fish
Student Author(s): Beh Reh (Biology)
Faculty Mentor(s): Ramji K. Bhandari (Biology)

Perchlorate, a chemical compound commonly used in military equipment, is found in air, water, soil, and breast milk, posing a threat to those living in war zones and near military training grounds. High levels of perchlorate can impact vertebrate reproduction, including fish.

However, it is unclear whether environmentally relevant levels affect fertility. To investigate this, we examined the effects of chronic perchlorate exposure on reproductive toxicity in adult medaka fish, mimicking male soldier exposure in the battlefield. Fish were exposed to 0, 10, and 10,000 ug/L potassium perchlorate and 10,000 ug/L perchlorate+3 mg/L vitamin C for 21 days, covering spermatogenesis. Perchlorate exposure reduced fertility and altered survival rates of F1 offspring. Testicular morphology showed dose-dependent effects on seminiferous tubules, with loss of various germ cells. Transcriptome profiling showed altered gene networks associated with germ cell function and hormone synthesis. Co-treatment of high concentration perchlorate and vitamin C increased expression of genes involved in protection against perchlorate exposure. Our findings suggest that perchlorate exposure induces molecular and morphological alterations in the adult testis, but vitamin C can mitigate some of the effects.

Why Examining the Role of Subjective Age in Older Adults Work Activity and Everyday Engagement
Student Author(s): Amarre Reid (Psychology)
Faculty Mentor(s): Dayna Touron (Psychology)

We are seeing people not only live longer than before, but they are also staying in the workforce a lot longer than they used to. Due to this, it is essential that we find ways to be more aware of how work engagement can influence older adults' successful aging and self-perception. Previous research suggests that the age that an older person feels can influence their social behavior (Montepare, 2020). The purpose of this research is to study how older adults' work participation and engagement in everyday social, physical, and mental activities can influence how old they feel and their perceptions of successful aging. This study includes data collected from 204 adults aged 60 and older. Participants self-reported their activity engagement and subjective age several times per day and reported their work participation by responding to various life and activity surveys at the start of the week. I predicted that higher work participation would negatively correlate with a lower subjective age and positively correlate with a higher report of successful aging. However, results did not find a significant relationship between subjective age and work participation, but we did find a correlation between subjective age and perception of successful aging. Although results did not fully support my hypothesis, this research can still be used to establish healthier working conditions for older adults, while also being mindful of the psychological impact work participation and subjective age can have on individuals.

Beyond parents' elaborations: Children's memory questions in reminiscing conversations are related to early metacognitive monitoring
Student Author(s): Catherine Ricci (Communication Sciences & Disorders), Olivia Cook (Post-Bac)
Faculty Mentor(s): Jennifer Coffman (Human Development and Family Studies)

An extant literature has focused on parents' scaffolding in reminiscing conversations (Fivush et al., 2006). However little is known about children's contributions in these conversations as they relate to their early metacognitive skills. In a longitudinal study, 98 kindergarteners (mean age = 5.66 yrs., 55% female) took park in an Object Memory Task (Baker-Ward et al., 1984) and were asked to "work to remember" 15 common objects for 2 minutes. Observations were coded for

children's strategy use, including *metacognitive monitoring*, as indexed by the number of times children sought information from the experimenter (e.g., *"What is this called?")* about an object. In a parent-child reminiscing task (Reese et al., 1993), dyads discussed two jointly-experienced events and conversations were coded for parents' and children's contributions. Children's self-initiated *memory questions* in reminiscing conversations were associated with their metacognitive monitoring behaviors in the Object Memory Task ($p<.05$). This and other findings will be presented to describe associations between parent-child conversations and children's deliberate memory and metacognition.

The Role of Technology in Planned Drinking among NC College Students
Student Author(s): Amanda Richardson (Psychology)
Faculty Mentor(s): Michaeline Jensen (Psychology)

The disinhibition pathway (youth higher in disinhibition drink more; Zucker et al., 2011) suggests that premeditation generally predicts *less* drinking. However, youth who are higher in premeditation sometimes *plan* to take risks (Maslowsky et al., 2019), as in youth who make plans for later drinking (e.g., figuring out who will buy the alcohol for a party). In the digital age, much of this planning for drinking occurs via technology (e.g., text message). The present project worked to create a measure of *planful alcohol-related text message use* in a sample of 267 college students who answered self-report questions on the ways in which they use technology to facilitate alcohol use (see Jensen, Hussong, & Baik, 2018 for details on general alcohol facilitative text message communication). We used exploratory factor analysis (EFA) and confirmatory factor analysis (CFA) to identify items that best tap planful alcohol-related text message use, with the result being a 6-item measure with good fit to the data ($\chi^2(9)= 15.677$, $p=.074$; RMSEA= .057, SRMR=.039). This measure could be useful in future research seeking to understand the ways in which premeditative youth may experience a unique risk pathway for drinking.

Social Support and Physical Activity in a Latina Population: A Seven Day Ecological Momentary Assessment Study
Student Author(s): Lauren Ridgeway (Kinesiology)
Faculty Mentor(s): Jaclyn Maher (Kinesiology)

Social support is an important factor associated with physical activity engagement among Latinas. Previous research has largely used cross-sectional or longitudinal designs to study these relations, but these approaches only tell us about relations between typical levels of social support and physical activity. It is unclear how aspects of social support experienced at particular moments throughout the day acutely impact subsequent physical activity. This study uses Latinas' ratings of current social support for physical activity completed three times per day for seven days on participants' smartphones and accelerometers worn by participants during the study to examine how aspects of social support reported at the questionnaire are associated with physical activity over the next three hours. Findings from this study will shed light on how social support relates to physical activity within days. Understanding how social support contributes to Latina's engagement in physical activity can help future multi-level interventions aiming to promote physical activity in this population.

Social Media as a Tool for Language Acquisition
Student Author(s): Alex Rios (Languages, Literatures and Cultures)
Faculty Mentor(s): Sara LittleJohn (Resedential Colleges)

Social media is a very useful tool for language acquisition, it allows people to connect with native speakers and learn natural language from a fluent speaker of the language. Through a native speaker, one can learn advanced grammatical concepts and new vocabulary, especially colloquialisms, while also practicing with someone who can give tips and corrections. I will support this argument by citing some studies discussing uses of computer assisted language learning (CALL) and analyzing their findings. One example of a source I will be using is titled *Seamless Language Learning: Second Language Learning with Social Media*. I choose this topic because I have found that my ability to speak my target languages has improved since I began using social media as a language learning tool. I want to better understand how this tool can be utilized and whether or not social media can be an effective tool for language learning. My goal is to utilize my evidence to prove that social media can be a useful tool for language acquisition and share my findings so others can further the general understanding of CALL. I also hope that others can find this research helpful in implementing social media as a language learning tool to further their own knowledge and be more comfortable speaking their target language.

House or Workshop? Mapping the Findings of House I 10,1 in Pompeii
Student Author(s): Katherine Rock (Archaeology)
Faculty Mentor(s): Robyn Le Blanc (Classical Studies)

For this project, I analyzed and mapped all the artifacts discovered within House I 10,1. This structure is in the Insula of the Menander, a major city block in Pompeii. The insula contains a large house known as Casa del Menandro, with several small 'houses' surrounding it. House I 10,1 is located in the northwest corner of the block, consisting of five rooms and two floors. In terms of artifacts, the structure lacked personal objects such as jewelry, toiletry items, or artwork. There were very few coins found and no human or animal remains. This led me to believe that the structure may not have been a house, but rather a workshop; perhaps with some connection to the Casa del Menandro. The poster contains an analysis of my hypothesis as well as a map of all findings. This project is important because it helps further our understanding of ancient societies. In particular, the preserved artifacts at Pompeii allow archaeologists to examine how citizens outside of Rome lived and what their houses looked like.

Happy Graduation to Me and Everyone of 2023
Student Author(s): Brandy Rodman (Art)
Faculty Mentor(s): Barbara Campbell Thomas (Art)

I am an African American artist who makes abstract paintings, drawings and collages that stand for freedom of creativity and self-expression. Throughout my journey of being in school, I have found and explored different meanings and forms of abstraction and I have incorporated many approaches into my style. This experimentation in making images is a way I try to be open-minded about the environment I see and experience around me.

When I create art, I don't like to follow a particular traditional rule. I believe the artist should be free to express themselves and to break out of pursuing something that they are not passionate about. I believe in breaking rules and having a free-flowing hand to grow as an artist and to express myself in my work.
The purpose of my work is to be able to be free, have fun and not think about anything else. Even if I'm planning the colors or materials I want to use, I still allow myself to go crazy without caring about what the world has to say. I want the audience to see that it's okay to make mistakes. All that matters is letting your vision come true.

The Sociocultural Context of Borderline Traits
Student Author(s): Breanna Rogers (Psychology)
Faculty Mentor(s): Blair Wisco (Psychology)

Borderline personality disorder (BPD) has a similar prevalence across different racial (Newhill & Vaughn, 2009) and gender groups (Grant et al., 2008). While prior research has investigated gender differences in BPD traits, limited research on racial differences exists. Research on racial differences in BPD has focused on women. Compared to White women, Black women reported more externalizing traits such as anger, verbal aggression, and physical aggression and fewer internalizing traits such as shame and guilt (De Genna & Feske, 2013).
A college sample (n=132) of Black and White women and men was used to observe racial and gender differences in BPD traits. For internalization, no effects or interactions were found, with the exception of shame, where White participants scored higher than Black participants. Results suggest gender differences in overall aggression, verbal aggression, and hostility, with men reporting more symptoms than women. No effect of race was observed. Gender and racial differences in physical aggression were observed, with men and Black individuals scoring higher than women and White individuals respectively. The results of the current study contradict some prior findings on internalization and externalization in BPD across racial and gender groups.

Virtual Vikings and Screen Recordings: Adapting Ethnography For The Digital Age
Student Author(s): Sophia Rosenberg (Anthropology)
Faculty Mentor(s): Susan Andreatta (Anthropology)

Ethnography has long been recognized as an effective method to document cultures and the people within them. However, due to a much-needed retrospective on the controversial origins of ethnography and the rise of new technologies, the method is taking on a new form. How can ethnography refigure itself for digital media, the online spaces that surround them, and the newfound cultures that are emerging as a result? Through a grounded, open-ended approach to ethnographic analysis and methods, this project explores xeno-virtual ethnography as a way to record cultures in virtual settings, and how the method prioritizes the informant's knowledge and rethink traditional power dynamics.

Examining the Role of Emotions and Motivation in Understanding Picky Eating
Student Author(s): Rory Rosenberger (Psychology)
Faculty Mentor(s): Jasmine DeJesus (Psychology)

The present study sought to examine how parents perceive picky eaters' motivations and emotions in different environments, as well as the impact that protagonist body size and gender have on assessments of food rejection and acceptance. A survey was given to assess how parents rate the emotional state and acceptability of the child protagonists' behaviors in situations where food is accepted or rejected, as well as to assess its validity and inform revisions for further use. This was administered to 101 adult parents of children between the ages of 3 to 12 years old. Body size was expected to compound negative assessments in cases of rejection. Quantitative results did not indicate that body size related to the assessments formed by parents. Ratings were generally more positive for food acceptance than rejection. Parents mostly selected "happy" as the emotion felt by protagonists in the food acceptance condition (277 out of 300 trials), but were more split in the food rejection condition, with "something else" (78/300), "sad" (74/300), and "disgusted" (67/300) as the most frequent selections. Further directions could explore the ways children understand the emotions and motivations of picky eaters.

The Effect of Aluminum on the uptake of microplastics in Barley
Student Author(s): Abdalkader Salaimah (Biology)
Faculty Mentor(s): Ayalew Osena (Biology)

Barley is an ancient crop that is very nutritious and important for humans. However, barley in of the crops that are more sensitive to Aluminum toxicity which is a major agricultural problem that affect 50% of the arable lands. Al even at micromolar concentrations inhibits root growth and may injure the root system which may be a pathway for emerging contaminant such as microplastics. This experiment was designed to test the effect of microplastic and the toxicity of Aluminum ions on the root growth of the barley seeds and how the root damage by aluminum might increase the uptake of microplastics. We hypothesized that root damage due to aluminum toxicity would increase the uptake of microplastics into the roots. Our findings showed that singly on in combined treatments, Al and microplastic decrease both root and shoot dry weight in barley. Experiments are ongoing to determine the effects of both treatments on the physiology of the plant including assay of antioxidant enzyme activity or mineral ion content. We hope our research will shade light on the impacting of toxic metals on the bioaccumulation of emerging contaminant and help in devising a mitigation strategy.

How have Afro-Germans shaped Germany from the 1800s-now?
Student Author(s): Joshua Schorr (Womens and Gender Studies)
Faculty Mentor(s): Sara LittleJohn (Residential Colleges)

Afro-Germans have played a significant role in Germany from the 1800s to now, by acting as family members, holocaust survivors, soldiers, and artists, along with many other roles. Despite such marginalization throughout history and in the present, Afro-Germans and people of African descent in Germany have used their agency to overcome the minimizing images of their experiences during Nazi Germany. I argue that awareness of the global African diaspora,

specifically Germany, can aid in giving Americans a better understanding of Black Europeans. By using Jaimee Swift's article The Erasure of People of African Descent in Nazi Germany from the African American Intellectual History Society website, I aim to address important organizations such as The Black German Cultural Society, The Initiative Schwarze Menschen in Deutschland (Initiative of Black People in Germany), and the Black German Heritage Research Association. I inform readers about the importance of understanding German history in regards to how a marginalized community established a culture despite tragedy and disapproval. I also explain how music, performances, and visual arts, have changed from the 1800s to now, due to the influence of Afro-Germans. Afro-Germans are not discussed in the American school system, leaving many Americans unaware of the history of Black Europeans. This research will discuss the importance of being aware of cultures outside of the US, while highlighting the impact Afro-Germans played in Germany.

Marijuana Chemical Exposure in Medaka Fathers Leads to Altered Gene Expression in Brain Tissue of Their Children
Student Author(s): Tyler Sexton (Biology), Yashi Feng (Biology), Xuegeng Wang (Biology)
Faculty Mentor(s): Ramji K. Bhandari (Biology), Mehwish Faheem (Biology)

Since legalization of marijuana for recreational and medicinal purposes in the US, more young adults who are reproductively active have access to its associated chemical, Delta-9 tetrahydrocannabinol (THC). This drug can induce alterations on the DNA of gametes from paternal consumption that may be inherited across future generations, although not fully known if this may cause abnormal neural health phenotypes, such as addiction. Hypothesis tested if THC induces transcriptional alteration in brain tissue, indicating adverse neural health conditions. Medaka fish are a prime model, as they process their genome like mammals, allowing insight into heritable epigenetic effects of THC exposure. For testing, sexually active male medaka fish were exposed to four levels of THC for 21 days. After, an epigenetic profile was performed on their sperm, as well as transcriptome profile of the brain in their male children (F1). Results showed paternal THC exposure led to altered gene expression in their testis as well as the brain tissue of F1, and presence of genes associated with increased addiction. This suggests that THC consumption by the father during his reproductively active preconception period may increase risk of addiction and adverse neural health effects in his offspring.

The Waists of Our World: History, Reasons, and Methods of Waist and Belly Binding in Global Cultures
Student Author(s): Sophie Shahan (Theatre)
Faculty Mentor(s): Tara Webb (Theatre)

From health reasons to aesthetics, waist binding has been something that has made its way through history and is still seen today for a variety of reasons. This research project examines a few common waist and belly binding practices seen throughout several non-Western countries, and how waist binding has influenced women’s wear in both the Western and global cultures throughout history. Along with an examination of the history and practices of waist and belly binding, this project will also explore the reasoning and methods of waist binding, such as how cultural and social reasons play a role in waist binding choices in different locations of the world.

Finally, this research will dive into how links such as maternity and fashion have common origins in waist-binding practices and will explore how specifically these reasons have influenced fashion in both Western and non-Western cultures over the last several centuries until today.

Imperial Coins of Apollo during the Cyprian Plague
Student Author(s): Abbi Shengulette (Classical Studies)
Faculty Mentor(s): Robyn Le Blanc (Classical Studies)

The increase in the appearance of Apollo, health deities, and other personifications on coinage during the Plague of Cyprian represents the impact major historical events have on daily life. Their appearance directly connects the people minting coins and the pandemic. The Cyprian Plague lasted twenty years during the Third Century and each emperor reflected the relationship between coinage and health in a different way. This paper focuses on the evolution of coinage over four emperors spread across the two decades: Trebonianus Gallus, Trajan Decius, Valerian, and Gallienus, and how their chosen imagery demonstrates an active or passive attitude towards the plague. The data is compiled from a period of 100 years and concludes that the Cyprian Plague associated Apollo and other health deities more closely with plague imagery than previous plagues.

Investigating the Freshman 15
Student Author(s): Chandler Shields (Nutrition)
Faculty Mentor(s): Sara LittleJohn (Residential Colleges)

The freshman 15 phenomenon was fabricated by Seventeen magazine in 1989 after a research study came out in 1984 about freshmen in college and their weight changes. The study concluded that college freshmen gain, on average, about 3-4 lbs during their freshman year, but the magazine adopted the term “freshman 15” because it was catchier. It is important to recognize behavior and food choice change as many students have not lived on their own prior to starting college. I am interested in investigating the the topic because social media continues to discuss the freshman 15 phenomenon and stigmatizing weight gain and it is a good opportunity to discuss the importance of nutrition and having a balanced lifestyle in college. Sources, such as Kathryn Ledford’s book, Year by Year - The Real College Life: Honest Advice from a Student's Point of View, are important to weed out anecdotal experiences and use evidence backed by scientific research to ease the minds of readers who may fear weight gain. Instead, incoming college freshmen should focus their energy into incorporating a balanced diet and lifestyle during their college years and focus less on their weight or the fear of gaining weight.

A Persistent Homology through Image Segmentation
Student Author(s): Joshua Slater (Mathematics & Statistics)
Faculty Mentor(s): Thomas Weighill (Mathematics & Statistics)

In a variety of problem domains, understanding the shape of data is highly valuable. Knowledge of the number of distinct clusters or the number of holes within data is foundational in a variety of disciplines, and persistent homology, a central tool within the emerging field of topological data analysis, enables us to extract this kind of structural information. While persistent

homology has seen successful application in many different settings, from sunspot detection to identifying the presence of gerrymandering, its use in large scale data science pipelines is hindered by its significant computational cost. Motivated by this limitation, this work proposes methods that allow neural networks to approximate the results of persistent homology computation. Furthermore, it is shown that the proposed methods admit strong approximation capability by the network at significantly reduced computation time compared to a state-of-the-art persistence homology computation library.

Solving CVPA Pollinator Garden Project: Connecting Community and Nature Through Art
Student Author(s): Ashe Smith (Art), Amabel Prisk (Theater)
Faculty Mentor(s): Leah Sobsey (Art), Tara Webb (Theater)

The past year and a half, we have been working alongside our faculty mentors and College of Visual and Performing Arts community members to cultivate a local pollinator garden in UNCG's Peabody Park. Funded by the Undergraduate Research Scholarship and Creativity Office, the pollinator garden serves as a sanctuary for our local pollinators and as a source of natural dyes/materials for the schools of Art and Theater. The garden sits at the base of what was the women's college amphitheater, paying homage to UNCG's historical roots and protection/preservation of foliage on campus. The artwork presented, created by Ashe Smith, is a physical, accessible representation of the garden's natural area. Flowers and leaves were pressed into the clay body to create a relief of the textures and aesthetics of the pollinator garden; oxides and glazes serve to replicate the colors found within the flowers. The pollinator project has served as an interdisciplinary outlet to uncover UNCG's rich history, discover practical garden skills, build community across CPVA schools, and bring awareness to the natural spaces UNCG has to offer.

Impacts of Nitrogen Deposition on the Longleaf Pine Savanna
Student Author(s): Logan Somero (Biology)
Faculty Mentor(s): Alyssa Young (Biology)

Historically, the longleaf pine (LLP) savanna ecosystem spanned ~92 million acres across the US Southeast, however, only 3% of that extent remains today, and restoration efforts are underway to preserve and restore the ecosystem. In the face of global change, restoration efforts need to consider whether the LLP ecosystem will be impacted by climate change factors, such as nitrogen deposition. In order to understand how LLP savanna restoration will be impacted by the increase of nitrogen in the soil, we performed a greenhouse experiment on the fourth floor of UNCG's Sullivan Science building. Over 6 months, dominant LLP savanna bunchgrasses, *Aristida stricta* (Wiregrass), were grown either in control (no nitrogen) soils, or with low (2 g/m^2), intermediate (5 g/m^2), or high (10 g/m^2) levels of nitrogen in the soil. Several traits were observed and measured for both the plants that received the varying levels of nitrogen in the soil and those that did not. We hypothesized that *A. stricta* plants with higher levels of nitrogen in the soil will have more growth than the control plants.

What factors determine the cost of attending public research universities?
Student Author(s): Shaniece Speller (Interior Architecture)
Faculty Mentor(s): John Sopper (Residential Colleges)

The burden of affording college and handling student debt is an important issue faced by people in the US who wish to attend college. While financial aid is available to those who qualify, sometimes the aid received doesn't cover the full cost, and therefore many students may have to take out loans or pay out of pocket. The most commonly used loan is the federal subsidized student loan. There are also private loans offered by for-profit companies. However, repaying these loans can be difficult. It can cause individuals and families to have issues with building their credit scores, or with buying a home. Carrying a student loan can lower one's net worth or disqualify you from a job. Understanding more about the process of paying for college could help people choose their options wisely. Furthermore, future generations could learn from this and prevent the same mistakes. Therefore, in this study I examine various websites that address topics on the pros and cons of attending college, I research articles that talk about how colleges are funded, and I explore YouTube videos, Ted Talks, podcasts, and apps (e.g. Porte, Tuition Tracker, and Wally) to understand best ways to make college affordable.

Imperial Inka Ceramics vs. Local Knock-offs: Assessing Provincial Status Differences at Yaracachi, Peru
Student Author(s): Tiffany Stephens (Archeology)
Faculty Mentor(s): Donna Nash (Archeology)

During the construction of a bus terminal in Moquegua, Peru, in 2010, a massive prehistoric cemetery was discovered. Emergency excavations at the Yaracachi site uncovered more than 1300 tombs. The material culture unearthed in these graves pertains to different cultural traditions, including the Inka, who would have invaded the region about 1400 C.E. A recent study conducted in 2018 and 2019 using the Yaracachi collection demonstrates that the cemetery was used to bury people of varying social standings. After analyzing the contents of the 619 photographed tombs, it was determined that 23 of them had Inka-style materials or imitations of a local character. The 23 graves had a wide variety of characteristics, including the number of interments, types, and quantity of grave goods, styles of pottery, and the sex and ages of the people interred. The Inka ceramic vessels found in these tombs will be the primary focus of this investigation. For this study, I compare the construction and content of tombs containing Imperial Inka pottery and local imitations of that style. These comparisons help demonstrate the similarities and differences between the individuals buried in the graves in terms of wealth and access to resources in the Inka Empire.

Emotional Reactions to Trauma Script-Driven Imagery among Trauma-Exposed Community Members
Student Author(s): Ainsley Strader (Psychology), Shae Nester (Psychology)
Faculty Mentor(s): Blair Wisco (Psychology)

Posttraumatic stress disorder (PTSD) is associated with strong emotional reactions to trauma reminders. Recency of trauma is known to be associated with PTSD symptom severity, but prior

research has not examined trauma recency and emotional reactions to trauma script-driven imagery. We hypothesized that the more recently an individual has experienced trauma, the stronger the emotional reaction (i.e., anxiety, sadness, carefulness) will be to the trauma script. The present study included 85 trauma-exposed community members. A trauma script, which included a personalized summary of the participant's trauma was created and read to the participant. Emotional reactions of anxiety, sadness, and carefulness were measured on a 1 to 7 scale before and after listening to the trauma script. There was a significant association between recency of trauma and feelings of anxiety after exposure to trauma script-driven imagery; however, there was no significant relationship between recency of trauma and feelings of carefulness or sadness. As well, recency of trauma did not interact with PTSD symptom severity, meaning emotional reactions to trauma-script-driven imagery do not vary by PTSD symptom severity. This study indicates that trauma recency is important for anxiety following trauma script-driven imagery but does not provide support for other negative emotional reactions.

Mingjue Helen Chen & Gyo Fujikawa
Student Author(s): Benjamin Strong (Art), Jayson Stephens (Art), Luz Borrayo (Art), Sarah Young (Art)
Faculty Mentor(s): Heather Holian (Art)

Gyo Fujikawa was hired at Walt Disney Studios as a designer in 1933. During her time at Disney Studios in California and in New York City. She designed promotional material Like designing the paper programs that were handed to viewers at the initial showings of Fantasia. Her time as a student and a mentor at Chouinard Art Institute made an impression on other artists who followed her scholarly path, notable of which was Mary Blair. She also enjoyed an extremely successful career making children's books. Mingjue Helen Chen is an artist currently working at Disney Studios. Hired around 2010 as a visual development artist for Tim Burton's 'Frankinweenie' in conjunction with Disney; Mingjue Helen Chen has rather quickly made her mark, getting the attention of Production Designer Andy Nicholson and Troy Nethercott, a producer at Warner Bros. Animation. Using this poster presentation we hope to show a timeline of how Asian American women have been present and essential to Disney's past, present, and future. We also hope to give a holistic image of the lives and impact of Gyo fujikawa & Mingjue Helen Chen outside of just the scope of their career at disney.

Impacts of Discrimination Among College Students: A Mixed-Method Examination

Student Author(s): Cameron Sturgis (Psychology)
Graduate Student Mentor: Alessandra R.Grillo (Psychology)
Faculty Mentor(s): Suzanne Vrshek-Schallhorn (Psychology)

Intro: While recent quantitative work shows that discrimination experiences are unique relative to other stressors, qualitative studies have received less attention (Williams et al., 2020). The current study sought to understand which qualitative features of discriminatory events were most upsetting, and to compare these experiences with other well-established life events, interpersonal and non-interpersonal events.
Method: Undergraduates (N=299, Mage=20.1, SD=3.8) were enrolled into an online study and

asked to describe three separate negative life events from the past two years: discrimination, interpersonal, and non-interpersonal events. Responses to an open-ended question probing what about the event most bothered them were coded using inductive content analysis (Bingham & Witkosky, 2021). Results: Among discriminatory events, raced-based discrimination was reported most (27.2%). People reported being most bothered by feelings of powerlessness and disrespect toward their identity. Among interpersonal events, ruptures of close relationships were reported most (20.5%). Emerging themes included feeling personally attacked or blamed. Among non-interpersonal events, academic adversities were reported most (21%). Themes emerged of academic underperformance (e.g., feelings of failure) and financial insecurity. Conclusions: Results support that discrimination events are qualitatively unique in their adverse impacts. I will discuss how findings may inform efforts to reduce the harmful effects of discrimination.

Gravitropic responses of Arabidopsis thaliana in randomized gravity and full spectrum light
Student Author(s): Katherine Swinson (Physics & Astronomy)
Faculty Mentor(s): Kiss John (Biology)

As mankind pushes out into space, it will become increasingly important for us to determine the ways in which plants are adversely affected by altered levels of gravity, as plants will be crucial sources of oxygen, water and food for astronauts on long-term space missions. In order to determine the ways in which plants are impacted by reduced gravity, experiments must be conducted in altered gravity environments, and those experiments will require proper Earth-based controls. In this experiment we categorized the effects of randomized gravity on *Arabidopsis thaliana* using a Random Positioning Machine (RPM). The RPM constantly changes the direction of gravity, while maintaining omnidirectional internal light, allowing for the study of responses to gravity independently from those to light. Because space aboard the ISS is so limited, the RPM has been used as a pseudo microgravity environment for Earth-based experiments and ground controls for spaceflight experiments. Seedlings were grown in the RPM in omnidirectional full spectrum light for six days, during which time the progression of root and shoot tropism were measured at 12 timepoints. By analyzing the growth and gravitropic responses of seedlings grown in the RPM and comparing them to measurements taken from plants in comparable conditions on the ISS, we were able determine the efficacy of the RPM as a ground control and microgravity-proxy.

Repetition as Meditation
Student Author(s): Tiffany Tan (Art)
Faculty Mentor(s): Nikki Blair (Art)

On My artwork is a reflection of the struggles of perfectionism against the unpredictable reality of art-making by using repetition as a meditative tool. Using both ceramic and two-dimensional mediums, I explore the appreciation of the art-making process including an understanding of materials and the repeated physical actions required for creating art. The process of assembling an idea for a project is difficult. The external and internal pressure to create artwork that is ideal and superb can be exacerbating. To manage this mental demand of needing to meet

expectations, I utilize the repetition of shapes and objects to create uniformity in an abstract yet systematic fashion. Focusing on the repetition of simpler shapes and objects, this meditative process helps ease the pressure of perfectionism and gives space to acceptance. My ceramic pieces focus on an appreciation of the material itself, and my paintings center around simple shapes and objects. Through my art, I hope to lessen the burden of perfectionism by showing how repetition of shapes and objects can be personally meaningful even if it is not ideal to others.

Exploring differences in racial-ethnic socialization messages within multigenerational Asian American families
Student Author(s): Tiffany Tan (Psychology), Puja Patel (Psychology)
Faculty Mentor(s): Gabriela Stein (Psychology)

In an increasingly racialized world, Asian parents are faced with the need to provide racial-ethnic socialization (RES) messages to pass down culture and raise awareness on racism. Importantly, how parents choose to engage in RES might greatly differ across generations. Example, first-generation Asian parents might focus on cultural messages as they might be unfamiliar with racial dynamics in the U.S. Whereas second-generation parents might be more willing to engage in racial socialization, but may struggle with proactive cultural socialization. Understanding such differences could provide insight on how Asian families prioritize and provide RES. Therefore, using thematic content analysis, data from 21 second-generation Asian parents was analyzed for RES messages they received from their first-generation parents and how they choose to socialize their own children. Preliminary results show that (a) half of the parents did not receive racial socialization, but all parents transmitted messages about race, (b) none of the parents received coping strategies, but almost all the parents offered coping strategies to their children, and (c) almost all of the parents expressed worry that improper RES may negatively impact the child. Future studies could explore how differences in RES second-generation parents received impacted their efficacy in providing RES.

Behavioral Study of C57BL/6 and LDLr Knockout (low-density lipoprotein, LDL, receptor) Mice Exposed to Carbon Nanodots for 16 Weeks
Student Author(s): Chenhao Tang (Biology), Kristina El-Khouri (Nutrition)
Faculty Mentor(s): Zhenquan Jia (Biology), Keith Erikson (Nutrition), Steve Fordahl (Nutition), Rada Petric (Biology)

Carbon Nanodots (CNDs) are a new class of carbon-based nanoparticles that are smaller than 10 nm. The nanoparticles have been used in the field of biomedicine, including biological imaging, biomedical sensing, and drug delivery. However, recent research on the potential toxicity of CNDs in vivo remains very limited and unclear. In this study, the C57BL/6 mice were exposed to 2.5 mg/kg of CNDs for 8 and 16 weeks, and LDLr-induced Knockout (low-density lipoprotein, LDL, receptor) mice were exposed to different doses of CNDs for 16 weeks. By using the open-field and the elevated plus maze behaviors tests, the mouse locomotor activity was recorded and measured. The exploratory and anxiety-like behaviors were tested to assess the possible effects of CNDs on mouse behavior based on physical performance. The open field and elevated maze trials demonstrated that the CNDs had no significant impact on the healthy C56BL-6 mice in 8- and 16 weeks trials. There was a significant decrease in open-arm activity

(duration) in LDLr knockout mice compared to healthy C576L/6 mice, suggesting an increased anxiety behavior. Intriguingly, exposure of LDLr knockout mice to CNDs at 2.5 mg/kg bw of CNDs for 16 weeks increases open arm activity of the mice, suggesting an anti-anxiety activity of CNDs. The results of this study would help assessment of the safety of CNDs in vivo.

Comparative Study on Extraction of Cellular Ribonucleic Acid
Student Author(s): Vienna Tang (Chemistry), Frank Morales Shnaider (Chemistry), Elizabeth Martin (Biochemistry), Moukbel Nasr (Biochemistry), Hongzhou Wang (Chemistry), Jennifer Simpson (Chemistry)
Faculty Mentor(s): Norman H. L. Chiu (Chemistry)

Ribonucleic acid (RNA) plays an important role in a variety of cellular activities, thus RNA is of great interest in many different research areas. To perform in vitro RNA analysis, all the existing methods require RNA to be first extracted from its cellular material. To avoid any interferences in the subsequent measurements, the extracted RNA should be free from other biomolecules such as proteins. The goal of this study is to compare the effectiveness of using two popular commercial products for RNA extraction, namely the Qiagen RNeasy kit and the TRIzol reagent. We focus our evaluation on the yield of RNA from a fixed number of cells, the purity of extracted RNA as well as the RNA integrity. To determine the yield of RNA, the absorbance of each RNA sample at 260 nm was acquired by using the Thermo Scientific NanoDrop™ UV-Vis Spectrophotometer. To evaluate the RNA purity, the absorbance ratios at 260/280 and 260/230 were measured. In the first case, the absorbance at 280 nm corresponds to an unwanted level of protein contamination in the RNA sample, and lower the ratio from the optimal value of 2.0. Whereas, in the latter case, the absorbance at 230 nm corresponds to a contamination of small molecules including guanidine thiocyanate used as part of the two commercial products, and lower the ratio from 2.2. To evaluate the RNA integrity, a chip-based electrophoresis technology in an Agilent Bioanalyzer was used. To ensure our results were reproducible, the RNA extraction from two different types of cell cultures were performed. Our initial results indicated the Qiagen kit would provide more pure RNA samples.

Copper-Dioxygen Model Systems and Importance of Ligand Electronic Effects
Student Author(s): Marcos Tapia (Chemistry), Azhaan Buttar (Chemistry)
Faculty Mentor(s): Shabnam Hematian (Chemistry)

Copper-dioxygen (O2) interactions are of great importance in biological and chemical transformations such as reversible binding, activation, and reduction of dioxygen. To better understand the role of structure and electronic properties in dictating these interactions, a common mononuclear copper(I) complex, utilizing a neutral tripodal tetradentate ligand tris(2-pyridylmethyl) amine (TMPA) has been prepared. Along with this parent molecule, two new TMPA-derivatives, one electron-deficient, one electron-rich, were synthesized and characterized. Here, we probed the reactivity of these mononuclear complexes toward O2 using electronic absorption and 19F- and 1H-nuclear magnetic resonance (NMR) spectroscopies. We will also discuss the importance of media in defining the speciation of copper(I) complexes in solution.

Why does fear bring pleasure?
Student Author(s): Jenesys Thomas (Kinesiology)
Faculty Mentor(s): Sara LittleJohn (Residential Colleges)

Fear brings people pleasure rather than apprehensiveness because people enjoy the thrill of being afraid, it's essentially like an adrenaline rush. The concept of fear varies among many different fields. We as in our society crave intense daunting experiences more and more. Fear doesn't necessarily have to mean getting scared at a haunted house or watching a horror movie. The concept of fear varies among many different fields. A person could enjoy watching a murder mystery or watching a shark movie. When we get scared, startled, or intensely surprised our brains are either programmed to enjoy the fight or flight feeling or we dislike this feeling. I am interested in this topic because I am very interested in the brain and how it works. I want to know what signals are sent from the brain to our bodies to allow us to enjoy being scared. I am also interested in this topic because I do not like watching horror movies often or going to haunted houses but, I do enjoy watching things with gore such as shark movies or psychological thrillers about serial killers. I want to find out why I enjoy such things and why others enjoy watching horror movies and going to haunted houses. The Primary sources I plan to use are psychology professors here at Uncg. I also plan on using articles and readings done by Psychologists as well as fear experts. An article I plan to use is "Why do we like to be scared? The Science behind the scream.", by Psychotherapist Robi Ludwig. A secondary source I could use is the students at Uncg, who can conduct a survey and get their opinions on my argument. My research will allow me to learn more about the brain and the different tactics the brain uses to send signals to our bodies.

What is the student debt crisis and how does it affect people with bachelor's and graduate degree?
Student Author(s): Tatyana Thomas (Nursing)
Faculty Mentor(s): John Sopper (Residential Colleges)

As an undergraduate, I often think about debt and the struggle that it causes. I often wonder why the student debt crisis is growing. With student loan debt reaching an all-time high of $17 trillion, I wanted to see the effect it has on young adult graduates and how debt affects different ethnicities/races and social classes. Therefore, I decided to research what is the effect of student debt. I researched the effects as well as proposed solutions for reducing student debt. I found that student loan debt can delay homeownership, delay starting a family, lock graduates into unsatisfactory jobs, and force graduates to make difficult sacrifices. Student loan debt especially impacts low-income borrowers, and that some graduates do not pay off their loans until they are in their forties. I also found that 1 in 4 graduates experience suicidal thoughts related to the financial issues arising from their student loan debt. As for solutions, lowering the cost of tuition, lowering interest rates on loans, and increasing Pell Grants and other grants are options.

Analysis of representations in chemistry textbooks: A literature review
Student Author(s): Bailey Thompson (English)
Faculty Mentor(s): Maia Popova (Chemistry)

Science textbooks can shape the way curriculum material is developed, delivered, and received. Thus, we have compiled a rigorous and comprehensive overview of the trends found in existing research studies analyzing chemistry textbooks. We reviewed research literature, from 1980 to 2021, focused on the quality and use of chemistry textbooks. The 78 studies included in our review were published in 22 different journals and involved the analysis of secondary and postsecondary chemistry textbooks used in more than 12 countries. To this end, our analysis summarized findings about the quality and use of chemistry textbooks. We found that studies tend to overemphasize the analysis of various components of textbooks such as how specific topics are taught by the textbooks or what representations, worked examples, and practice problems are used in the textbooks. At the same time, there are very few studies focusing on how instructors and students use chemistry textbooks in their teaching and learning, as well as how authors, editors, reviewers, and publishers develop the textbooks. This presentation will summarize the findings from our literature review and discuss the implications for future research.

Evaluation of RNAstructure To Predict RNA Secondary Structure with Non-canonical Base
Student Author(s): Sydney Thompson (Biochemistry)
Faculty Mentor(s): Norman Chiu (Chemistry)

One of the well-established and proven relationships in biochemical studies is the function of a specific biomolecule is directly related to its molecule structure. However, owing to several technical challenges, it is often NOT feasible to experimentally determine the accurate molecular structure of a biomolecule. Therefore, in silico simulation of molecular structures has become a viable approach to predict biomolecular structures. In this study, our goal is to explore the use of a developed computer program called RNAstructure to predict the secondary structure of RNA molecules with a non-canonical base. To the best of our knowledge, none of the current online programs including RNAstructure were set up to predict RNA structures containing any type of RNA modifications. In general, there are over 170 RNA modifications. Our initial study focuses on one of the most common modifications of adenosine called N1-methyladenosine (m1A), which can prohibit the Watson-Crick base pairing and potentially alter the RNA structures. To validate our results from using RNAstructure, we compare our results with the data obtained from known RNA structures.

Epstein-Barr Virus Replication Triggers Cancer Cells to Migrate.
Student Author(s): Kate Tirrell (Biology), Kristen Mitchell (Biology)
Faculty Mentor(s): Amy Adamson (Biology)

Epstein-Barr Virus (EBV), which is a member of the Herpesvirus family, is an extremely prolific virus that infects approximately 90% of the human population. While initial infection is generally mild, it has shown a strong association with certain types of cancers. Viruses that cause

cancer do so by inserting their genetic material into a host's cells, where it interrupts the normal function of the cell and ultimately triggers oncogenesis. When cells become cancerous and move throughout the body, it is known as metastasis. This cell migration is our main focus of our research. Our lab utilizes many research methods to study how exactly EBV is triggering cell migration, including wound healing assays, western blotting, and PCR. Previous research in our lab has found that lytic EBV cells do in fact migrate, and we determined that this migration occurs during the immediate-early replication phase. We also found that lytic replication causes the activation of MAPK interacting protein kinase (Mnk1), and that overexpression of Mnk1 enhances cell migration. Overall, we have identified a mechanism by which the cancer-associated EBV virus can trigger migration of cells, a hallmark of metastasis.

On My Honor, I Will Try Anything Once! A Queer Celebration and History of the Largest Girl's Organization in the United States
Student Author(s): Lukas Tucker (History)
Faculty Mentor(s): Mandy Cooper (History)

Ample legislation hopes to suppress the exposure of youth to LGBT ideas and culture. Whether in private organizations such as scouting or public ones such as schools, the Supreme Court has affirmed case after case to prevent youth from exploring their sexuality. Yet, many youths have explored ideas of sexuality and gender identity in homosocial spaces for generations. This project thus examines the Girl Scouts as a queer space, with a focus on how youth explore ideas of sexuality in homosocial spaces and how that exploration can be influenced by organization politics and parental figures. Millions of children across the United States have taken part in Girl Scouts since its founding in the 1910s; consequently, studying the Girl Scouts provides a glimpse into how youths have explored ideas of sexuality over the last century—and how that exploration has often been influenced by external politics.

The Effect of Grazing Intensity on Specific Leaf Area of a Common Grass and Forb Species at Two Mixed-Grass Prairie Sites
Student Author(s): Fatuma Tuider (Biology)
Faculty Mentor(s): Sally Koerner (Biology), Kathryn Bloodworth (Biology)

Grasslands are the United States' largest biome, with 22% being mixed-grass prairies. Approximately a third of which are used for agriculture and livestock production. Cattle, a common livestock animal, stimulate plant growth via grazing. Distinguishing changes in plant traits (e.g. height, or leaf size) allows us to understand how increased cattle grazing alters plant communities. Specific leaf area (SLA) is a useful trait that can be used to estimate plant growth. SLA changes depending on the species or environmental conditions. Some species tolerate grazing, which typically results in a higher SLA, while other species do not tolerate grazing, resulting in a lower SLA. Understanding how SLA differs within mixed-grass prairies is understudied but could provide valuable information about the health of this ecoregion.
We assessed changes in SLA at the community level and within two common species, Needle and Thread Grass and Scarlet Globemallow. Over 50 plant species were measured at two mixed-grass prairie sites within three grazing intensities (low, medium, and high). We found no significant differences in SLA across communities or common species. This lack of change within

Scarlet Globemallow is potentially due to its low sensitivity to grazing. Needle and Thread grass did not change in SLA, suggesting that it may be resilient to grazing. This study provides insight into changes in SLA which may lead to changes in processes such as photosynthesis. To further investigate the effects of grazing on plants we should assess how other plant traits respond to grazing.

Assessing the effect of cattle grazing intensities on mixed-grass prairie arthropod communities.
Student Author(s): Kaysa Vaarre-Lamoureux (Biology), Kathryn Bloodworth (Health Sciences)
Faculty Mentor(s): Sally Koerner (Biology)

Cattle and arthropods are important herbivores in grasslands, but little is known about how they interact. This is important to investigate considering that there are widespread declines in arthropods, as well as rises in cattle grazing. Changes in arthropods as a result of cattle grazing may be from changes in ecosystem function. Therefore, we investigated how arthropod communities and community-weighted traits (plant traits weighted by species abundance) were altered by cattle grazing.
Arthropods were collected in Montana in three cattle grazing intensities before being identified. Specific leaf area (SLA) and height were measured and combined with plant species abundance data to calculate community-weighted means of SLA and height to assess their response to cattle grazing treatments. We found that arthropod richness and abundance decrease as cattle grazing increases and that traits may help to identify how cattle grazing indirectly alters arthropods. This work will allow for science-based management practices that avoid deterioration of arthropod communities and the ecosystem

What types of environments produce negative outcomes for foster children, and how do they suffer from it?
Student Author(s): Julitza Valle (Biology)
Faculty Mentor(s): John Sopper (Residential Colleges)

It is essential to understand how the experience of youth in foster care homes can lead to physical, mental, and behavioral issues. Through my research, I discovered that the environments within foster care and family group homes differ. I found that certain factors within the foster care environment such as abuse and neglect, multiple placements, and a lack of specialized training for those providing foster care are often associated with higher rates of run-away behavior and greater educational challenges among foster care children. My research led me to uncover and acknowledge the issues so that the community can contribute to developing foster homes capable of responding to the behavioral and emotional needs of abused and neglected children.

Use of public data to map built environment disparities for the design of community-based physical activity interventions
Student Author(s): Stefanie Vidal (Public Health Education)
Faculty Mentor(s): Sandra Echeverria (Public Health Education)

Previous research indicates that the built environment, specifically the availability of physical activity (PA) resources, plays a significant role in the health of communities. Physical inactivity can increase risk of developing chronic health conditions such as diabetes, cancers, and can reduce survival. Promoting a supportive environment can help residents add regular PA in their daily lives. The main aim of this study is to examine PA resources (public and private) available within the Burlington and Greensboro area to determine possible areas that need more attention and resources. This information was included in a community-friendly guide for community members and stakeholders to create civic engagement, policy change, health initiatives, and programs. In the study, I gathered data on private physical activity resources through Google searches and public PA resources through the city's parks and recreation webpage. Using a free version of geospatial analytic program, ArcGIS Online, I mapped out the PA resources available to assess the built environment. The process for locating, mapping, and using data was added to the community guide and will be shared with community groups for advocacy and program planning.

Feeding practices and obesity risk among Latino infants
Student Author(s): Luz Selena Villa Robles (Nutrition), Kristen McElhenny (Nutrition), Diana Marocs Rosas (Nutrition)
Faculty Mentor(s): Jigna Dharod (Nutrition)

Compared to other racial/ethnic groups, Latino children have a much higher rate of obesity. Considering the high predictive value of weight gain during infancy in determining obesity later in life, the main objective of the study was to understand the prevalence of overweight/obesity and feeding practices among Latino infants. For the study, 95 Latino mother-infant dyads were recruited from a local pediatric clinic. Mothers were interviewed at regular intervals to collect information on breastfeeding and other feeding behaviors. About one-third of the infants were > 85th percentile (overweight) for weight for length on a growth chart. In examining the association between feeding practices and growth among infants, it was found that those who were formula-fed more frequently were more likely to gain excess weight. In conclusion, the risk of overweight/obesity begins as early as infancy among Latino children. Interventions and programs supporting optimal feeding practices are critical in reducing childhood obesity and related disparities experienced by Latino children.

Effects of Psychosocial Predictors on Female Adolescents' Daily Physical Activity
Student Author(s): Alexa Villarreal (Public Health Education)
Faculty Mentor(s): Jessica Dollar (Kinesiology), Jaclyn Maher (Kinesiology)

Physical activity (PA) is a key component of a healthy lifestyle. Adolescents who engage in PA are more likely to maintain a healthy lifestyle and reduce the risks of developing chronic diseases. Despite these benefits, most adolescents do not meet the daily moderate to vigorous

PA requirements, and the barriers to PA are widely unknown. This study aims to: 1) examine if female adolescents' daily intentions of engaging in PA at the start of the day are associated with greater PA levels, and 2) examine if greater social support moderates the association between female adolescents' daily intentions of PA and PA levels. Female adolescents (ages 12-18) respond to questionnaires every morning and every night for 28 days. Morning questionnaires assess adolescents' intentions to engage in PA and evening questionnaires assess perceptions of social support that day and PA levels. Multiple regression analyses will be conducted to address the study's aims. These findings will provide insights into barriers and facilitators of female adolescents' PA, thus creating intervention strategies to promote PA in adolescents.

Unity Holiday Spectacular
Student Author(s): Dominic Walker (Theatre)
Faculty Mentor(s): Natalie Sowell (Theatre)

The purpose of this project was to use one's resources to create a collective and bring together artists to discover the benefits of interdisciplinary art and networking towards fruition AND success. To be able to give people in the community the opportunity to see and experience the different traditions of those on stage while being visually pleased with lights, costumes and set design, it proved to be an experience not soon forgotten. There are many people who do not get to enjoy the bliss and wonder of spending time with family, joy and most importantly, love.
The study analyzed and exercised the use of different types of art i.e., Visual art, sound design (Music and SFX), lighting design etc. I was able to see the process of what it took to put a show together from scratch and see what will and can be made from connecting different art forms together to make a show (art forms not traditionally utilized in theater). It also opened possible new methods on how to work in the theater and show production, creating new skills and setting precedents in performance.

An argument for the lack of mental health stigma awareness for the middle-aged male population within the United States.
Student Author(s): Emily Wanamaker (Human Development and Family Studies),
Faculty Mentor(s): Sara Littlejohn (Residential Colleges)

The mental health of U.S. males between the ages of 40-60 has suffered due to a present stigma. The surrounding stigma deals with oppression, judgment, hate, and otherwise the idea that males within that population deserve shame for dealing with mental illness. This view has led this population to deal with an increased vulnerability related to suicide and mental struggles. Many within this population also have less of a chance to reach out to mental health resources and programs, which means that they are more likely to suppress personal suffering. Societal pressures have told men for centuries that they must never expose personal suffering or emotions, as those feelings would lessen their overall manliness. Utilizing sources such as the article "The Mental Health Troubles of Middle-Aged Men" from Psychology Today by Rob Whitley, I will inform readers and make them aware of the stigma surrounding the mental health of middle-aged men in the United States and will discuss the negative effects it has had on the population.

Entertainment and Luxury: Executions and the Monument at the Tower
Student Author(s): Hannah Ward (English)
Faculty Mentor(s): Christopher Hodgkins (English)

Entertainment and Luxury: Executions and the Monument at the Tower is an essay written by Hannah Ward during the Summer 2022 term while she was abroad in London, England. Written with the support of faculty mentor Dr. Christopher Hodgkins, this essay explores how the construction of the Execution Monument, on the Tower Green at the Tower of London, shapes our understanding of London's bloody history of executions. This presentation will explore a few famous executions, such as those of Anne Askew (outside London's gates in Smithfield) and Anne Boleyn (on Tower Green), while also noting the differences between high-class and peasant-class executions. The examples also will be presented in the context of political and religious reasoning behind executions. London's bloodiest form of entertainment will be considered alongside the pristine monument that marks the site where many of these executions were witnessed. Examining these seemingly contradictory representations of the history of executions will allow for audience members to understand the historical presence of executions as a form of public entertainment.

Emotion Regulation in Trauma-Exposed Adult Community Members: Distinguishing Resilience, Recovery, and Chronic PTSD
Student Author(s): Sara Wheeler (Psychology), Cameron Pugach (Post-Bac)
Faculty Mentor(s): Blair Wisco (Psychology)

Emotion regulation refers to strategies that people use to influence their emotions (Gross, 1998). Rumination, cognitive reappraisal, and expressive suppression are emotion regulation strategies often associated with PTSD (Seligowski et al., 2015). Although these strategies are associated with concurrent PTSD symptoms, little research has examined whether individuals who have recovered from PTSD continue to use these unhelpful strategies, potentially putting them at risk for PTSD recurrence. The current study used current and past PTSD diagnostic clinical interviews to examine whether these emotion regulation strategies distinguish resilient from recovered individuals (N=80). Univariate tests showed an effect of PTSD group on rumination ($F(2, 75)=9.40$, $p<.001$, partial $\eta^2=.20$), but not cognitive reappraisal ($F(2, 75)=1.05$, $p=.641$, partial $\eta^2=.01$) or expressive suppression $F(2, 75)=1.15$, $p=.321$, partial $\eta^2=.03$. Bonferroni post-hoc tests showed that the chronic PTSD group ($M=2.83$, $SD=.63$) reported higher levels of rumination than either the resilience ($M=2.13$, $SD=.84$) or recovery groups ($M=2.47$, $SD=.78$). Our results point to the need for future work to determine how emotion regulation strategies unfold in relation to PTSD over time following trauma exposure.

Accessing natural variation in grain size in tef (Eragrostis tef) genotypes for genetic improvements

Student Author(s): Eric Whisnant (Biology), Araya Daniel (Biology), Pina Willy (Biology), Abdlakader Salaimah (Biology)
Faculty Mentor(s): Ayalew Ligaba-Osena (Biology)

Eragrostis tef is a tropical grain grown mostly in East Africa's highlands. Much of the world has likely never heard of tef, despite it being Ethiopia's major staple grain. The grain is increasing in popularity globally due to being gluten-free and its high mineral content (primarily iron, calcium, phosphorus, and copper). Some reference tef as an “orphan crop” due to its lack of awareness and research. Tef grains are the smallest of all cereals, only about 1/150th of a wheat grain. This small seed is one feature that make growing and harvesting so challenging. This has limited large scale production of tef in the western world including the US where labor cost is high. This necessitated improvement of seed size via molecular breeding. Using microscopic image analysis, we have observed significant variation in seed size attributes among 125 unique tef genotypes that we have analyzed so far. We will also determine thousand grain weight (TGW) of three representative samples from smallest, medium, and largest categories. Our preliminary findings showed up to nine-fold difference in TGW between the largest and smallest seeds. These findings made us believe that there are novel genetic mechanisms regulating seed size in tef. Moreover, because tef grains are nutrient-rich, we are also interested in how seed size may affect mineral concentration and localization in seeds. We have obtained preliminary data using X-ray Fluorescence (XRF) that shows variation in mineral concentrations within the tef seed endosperm and embryo. Of interest is embryo and endosperm size and mineral localization. The endosperm is the area of the seed that is generally the most significant source of bioavailable nutrients. However, because micronutrients such as Fe and Zn are stored in the embryo (the germ), we are also interested to study how manipulation of seed size regulating genes would affect micronutrient accumulation in the grains. We expect to improve seed size without compromising its nutritional quality. Novel genes identified and characterized in tef have a potential to improve other related underutilized crops such as millet which have great potential for improving nutrition and food security.

Exploration of Antimicrobial Compounds in Turnera diffusa.

Student Author(s): Empress V. Williams (Chemistry)
Faculty Mentor(s): Nadja B. Cech (Chemistry)

Natural products play a huge role in medicinal drug discovery due to their encompassing breadth of chemical space. Turnera diffusa, a flowering shrub native to Mexico, South and Central America, and the southern United States, has been utilized for centuries by indigenous peoples as a general wellness tonic. Currently, it is used most prominently for its stimulant properties. In recent years, T. diffusa has been highlighted for its antimicrobial properties, particularly against Methicillin-resistant Staphylococcus aureus (MRSA). Methicillin-resistant Staphylococcus aureus is a gram(+) skin bacteria which can lead to severe, life threatening

infection. Due to increasing resistance, these pathogens pose a health threat in that they render current antibiotics useless and new antimicrobials are needed to combat this resistance. Natural products provide promising solutions as they contain diverse secondary metabolites to fight these superbugs and offer a lasting solution to microbial infections. Broth microdilution antimicrobial assessments support claims of antimicrobial activity made by preliminary research. This project aims to attribute the bioactivity of Turnera diffusa extracts to specific compounds. Ultra high-performance liquid chromatography in tandem with high resolution mass spectrometry (UPLC-HRMS) data is coupled to the activity data to inform future separation. Inhouse statistical tools are used to predict compounds correlated to activity. Promising leads will be presented. Follow-up studies for this project are on-going.

The history of female hysteria continues to have detrimental impacts on the perceptions and medical treatments of women today.
Student Author(s): Megan Wilson (Languages, Literatures and Cultures), Ashby College
Faculty Mentor(s): Sara Littlejohn (English)

The longstanding use of diagnosing "female problems" as a condition called hysteria has left a negative impact on the perceptions of women today both socially and medically. From as early as the 5th century, hysteria has been believed to be a physical and mental illness caused by the uterus or "wandering womb" (Hippocrates). The idea that hysteria is a female-specific condition caused by the uterus has created a foundation of sexism and bias against women. Women are now often labeled as "crazy" or "overly emotional". In my research, I will use a variety of sources ranging from historical analysis of studies on "hysteria" patients as well as modern observations on the mistreatment of and stigma against women today. From my research, I speculate I will find a prominent connection between the longstanding history of female hysteria and how it harms the perceptions and treatments of women today.

Shadows of Light: A Versatile Fashion Collection
Student Author(s): Lisa Woolfall (Consumer Apparel & Retail Studies)
Faculty Mentor(s): Haeun (Grace) Bang (Consumer Apparel & Retail Studies)

Sustainability is growing in the fashion industry, but often the industry focuses on sourcing and the supply chain and not the entire lifecycle of a garment. While materials and resources heavily impact how sustainable a garment is, sustainability should not end once the product reaches the consumer. The popularity of fast fashion leads to overconsumption and extreme waste. The purpose of this project was to create mini apparel collection comprised of four versatile and long-lasting garments. Each piece can be worn and styled at least three different ways. For example, a dress that can be tied into a top or a skirt. Through details such as ties and snaps, garments are much more versatile in the number of ways they can be worn. My inspiration stems from shadows of light. When light streams through windows and objects in unexpected ways, it creates shadowed shapes but with light. Likewise, versatile garments change in unexpected ways and bring new brightness and hope for sustainability in the fashion industry.

This project demonstrates how versatile garments promote sustainability by extending product lifecycles, reducing the need for overconsumption, and minimizing waste from product disposal.

Investigating Proactive Interference Effects After Switching Encoding Language in Bilingual Individuals
Student Author(s): Mufeng Xu (Psychology)
Faculty Mentor(s): Robert Wiley (Psychology), Peter Delaney (Psychology)

Proactive interference (PI) is the phenomenon where previously learned information hinders recall of later learned information. A common method of studying PI is to ask participants to memorize several lists of words, with poorer recall of words from later lists attributed to interference from earlier lists. Previous research has shown that certain strategies can be used to increase recall performance by reducing PI. For bilingual individuals, this includes switching the language of presentation on the last list. However, there has not been any research on whether mental translation can be used as a conscious strategy to reduce PI.
In the current study, we investigate whether switching the encoding language in bilingual individuals reduces the effects of PI. We adopt a 2 (English vs. Spanish) by 3 (Control vs. Shift vs. Translate) factorial design, recruiting both Spanish dominant and English dominant bilinguals. Participants are instructed to memorize words from four lists and then recall them. In the Control condition, all four lists present words in the same language. In the language Shift condition, words on the last list are presented in the other language relative to the first three. In the Translate condition, participants are asked to mentally translate the words on the fourth list. We expect participants in the mental translation condition to show a larger reduction in PI compared to those in the Control and Shift groups, resulting in higher recall of words from the last list. The findings have implications for the understanding of bilingual processing as well as the cognition processes underlying the effects of PI.

URSCO *and* NC DOCKS

UNC GREENSBORO
Undergraduate
Research, Scholarship
and Creativity Office

NC DOCKS
digital online collection of knowledge and scholarship

Through a partnership with the University Libraries, students involved in the Thomas Undergraduate Research and Creativity Expo have the option of contributing scholarly works to NC DOCKS, UNCG's open access institutional repository.

NC DOCKS (the North Carolina Digital Online Collection of Knowledge and Scholarship; http://libres.uncg.edu/ir/uncg/) is a full-text database that brings together and showcases a wide variety of scholarship from UNCG faculty members and students, including thousands of articles, audio recordings, theses, dissertations, and other formats. All materials are indexed by Google and are freely available to scholars and researchers worldwide.

NC DOCKS can help you share your works with a wide audience, both on-campus and off. Articles that are posted in repositories like NC DOCKS tend to be read and cited more than those that are not. NC DOCKS also provides a convenient, library-managed system that can bring your works together in one place.

To learn more about participating in NC DOCKS, contact Lee Phillips, URSCO Director.

BOOK INFORMATION

Cover Design by Vrinda Prabhakaram Ganti
MS: Computer Science
Graduation: May 2023

Vrinda Prabhakaram Ganti (b. 1998) is a Computer Science Graduate Student and URSCO Graduate Assistant. She doesn't know what she's doing in her life. She is just happy to exist.

UNC GREENSBORO

Undergraduate
Research, Scholarship
and Creativity Office