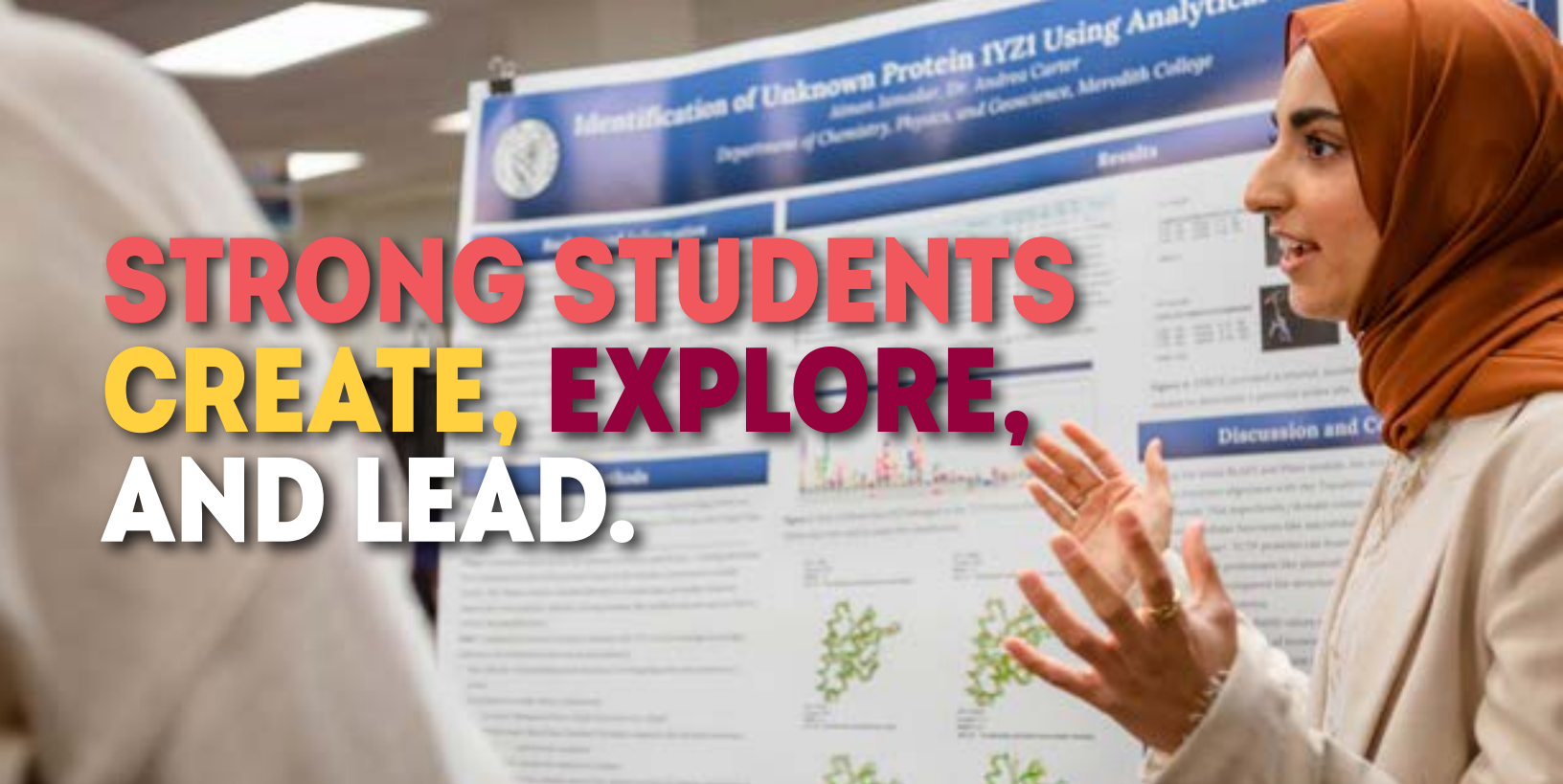


STRONG STUDENTS CREATE, EXPLORE, AND LEAD.



UNDERGRADUATE RESEARCH CONFERENCE
ANNUAL ACADEMIC AND LEADERSHIP AWARDS CEREMONY
SPECIAL EVENTS HIGHLIGHTING STUDENTS' ACCOMPLISHMENTS

22ND ANNUAL CELEBRATING STUDENT ACHIEVEMENT

Program of Events
Thursday, April 18, 2024

MEREDITH
COLLEGE

GOING
STRONG

WELCOME

Another CSA Day and another opportunity to be amazed by what Meredith students accomplish in their quest for knowledge and information. More important, it is a day to celebrate students' realizations that they can and do have the intellect, curiosity, and discipline to actually pose important questions and generate hypotheses and possible responses.

Whether a scientist, artist, or humanist, students on CSA Day demonstrate the many ways their learning crosses from classroom or lab or library into application—from reading and conversation into doing—from asking into answering and, perhaps, asking another question after that.

All around us today, we witness evidence of the journey of those truly taking control of their learning. For faculty, there is little more exciting than the glimpse CSA presentations and performances give us of our students' growth and of their evolution into top thinkers and practitioners in their areas of study. It is the difference between being able to answer test questions about concepts to being able to build, expand, or even deconstruct those concepts for various purposes.

Ultimately, one of the questions CSA Day encourages us to ask hinges on relevance: Why does this matter? What does the answer mean for whatever next steps our inquiry leads? Does (and how does) this new information or process or application benefit humanity or this discipline?

Frustrating for some is that we don't always know the answers to those questions or how the answers may affect our lives. Indeed, history provides numerous examples of pharmaceuticals intended for treatment of one ailment, only to discover they have far more powerful results treating a different ailment. The side effect, in many cases, becomes the primary use. Just as bubble wrap was originally intended as textured wallpaper, toy slinkies were originally used as naval equipment to protect equipment on rough seas, and Listerine was originally intended as a post-surgical antiseptic to prevent infection, today we see discoveries and new information for which we may not find a use for years.

But just as researchers knew the basic chemical composition for treatment of viruses and vaccines that came to our service during the height of the COVID years, meaning the tweaking of that composition gave us treatments and support months and perhaps years or even decades before we would have had those answers, it is a good reminder that asking questions—even if we don't have an immediate application for the answers—is one of progressive civilization's greatest assets. It is perhaps even its greatest advantage in being able to survive. Those are heady and serious ideas. Today, we celebrate our capacity to wonder, to appreciate how our minds work, to enjoy the collaborative spirit between students and their faculty, to engage in the excitement of new knowledge and techniques and outcomes.

Evidence of the value of education is never more front-and-center than on CSA Day. Here's to the tradition of engagement, inquiry, and excellence that abounds at Meredith College.

President Jo Allen, '80

ACKNOWLEDGEMENTS

The commitment and dedication of Meredith students, COM 316 students, Student Technology and Training (STAT) team, faculty and staff make this day of celebrating student achievement possible. Special thanks go to —

Jo Allen, '80, President

Matthew Poslusny, Senior Vice President and Provost

Jean Jackson, '75, Vice President for College Programs

Carolina Perez-Heydrich, Director of Undergraduate Research

Cheryl Jenkins, Director, Office of Student Leadership and Service

Kathryn Pleasant, Administrative Assistant for Undergraduate Research

The Undergraduate Research Advisory Committee

Marissa McCauley, Vanessa Harris, Charlotte McKinney, and Jimmy Boston, Department of Marketing

Laura Davidson, Jeffrey Waller, and the Reference staff of Carlyle Campbell Library

Brian Thornburg and Rick McBane, Media Services

Bill Brown, Jim Frick, Eric Leary, Savi Swiggard, Meredith Events

The faculty mentors who have given concentration, care, and many extra hours to encourage and support today's student presenters and performers.

Day at a Glance

8:30 – 9:15 a.m.	Morning Poster Presentation Session	<i>Carlyle Campbell Library Ground Floor</i>
8:45 – 11:15 a.m.	Oral Presentations: Music	<i>Carswell Concert Hall</i>
9 – 9:45 a.m.	Psychology Awards Presentation	<i>Ledford Lobby</i>
9:45 – 10:15 a.m.	PhotoVoice	<i>Ledford 111</i>
9:15 – 9:45 a.m.	Oral Presentations: Design	<i>SMB 118</i>
9:15 – 10:15 a.m.	Oral Presentations: Politics and Public Policy	<i>SMB 162</i>
9:15 – 11 a.m.	Oral Presentations: Art History	<i>Harris 214</i>
10 – 10:45 a.m.	Oral Presentations: Gender and Sexuality	<i>SMB 118</i>
10:15 – 11 a.m.	Oral Presentations: Student Mental Health	<i>Ledford 101</i>
10:15 – 11 a.m.	Oral Presentations: Applications in Data Science	<i>SMB 162</i>
11:30 – 12:15 p.m.	Student Achievement in Leadership Awards	<i>Jones Auditorium</i>
12:15 – 1:45 p.m.	Sensory Performance Showcase	<i>Johnson Hall Fountain</i>

Loom and action painters from the Art Department, a Sensory Panel provided by the Department of Nutrition, Health and Human Performance, food trucks, and complimentary flavored ice will be available throughout the event.

12:15 p.m.	Welcome	
12:20 p.m.	Meredith Theatre Department: Warm-Up	
12:30 p.m.	Meredith Music Department Voice Students: Music Intro	
12:40 p.m.	Meredith Dance Improvisation Group	
12:50 p.m.	Extra Theater Company: Excerpts from Miscast Cabaret	
1 p.m.	Chamber Musicians of the Meredith Philharmonic: Interlude	
1:10 p.m.	Meredith College Dance Improvisation Class	
1:20 p.m.	Poetry and Prose Readings by Meredith Students	
1:30 p.m.	Chamber Musicians of the Meredith Philharmonic: Closing	
1:35 p.m.	Primal Scream	
12:15 – 2 p.m.	Senior Spotlights: Celebrating the Next Steps for the Class of 2024	<i>Cate Center Alcove (1st Floor)</i>

12:30 – 1:30 p.m.	The Colton Reveal	<i>Kresge Auditorium</i>
12:45 – 1:30 p.m.	Senior Fashion Show	<i>SMB Fountain and Atrium</i>
1 – 1:30 p.m.	Student Broadcast Media: MCSN and Wings Up	<i>CHESS News Studio</i>
1 – 1:45 p.m.	Alpha Sigma Lambda Induction Ceremony and Honor Cord Presentation	<i>Jones Chapel Common Room</i>
1:30 – 2:30 p.m.	Oral Presentations: Ecology	<i>SMB 162</i>
1:30 – 2:30 p.m.	Oral Presentations: Effects on Learning	<i>Ledford 101</i>
1:30 – 2:30 p.m.	Lambda Pi Eta Honor Society Induction Ceremony	<i>CHESS Lobby</i>
2 – 3:45 p.m.	Interior Design Senior Portfolio Review	<i>Martin Hall, Interior Design Studios 240 and 242</i>
2 – 3 p.m.	Art Student Showcase	<i>Gaddy Hamrick 137 and 1st Floor Hallway</i>
2 – 2:45 p.m.	Oral Presentations: Literature and Culture	<i>Harris 214</i>
2:15 – 3:30 p.m.	Oral Presentations: Chemistry and Mathematics	<i>SMB 118</i>
2:30 – 3:15 p.m.	Sociology and Criminology Honor Societies Induction Ceremony	<i>Lux 207</i>
2:30 – 3:45 p.m.	School of Business Student Achievement Celebration	<i>Kresge Auditorium</i>
3 – 3:45 p.m.	Afternoon Poster Presentation Session	<i>Carlyle Campbell Library Ground Floor</i>
4 – 5 p.m.	Student Academic and Leadership Awards	<i>Jones Auditorium</i>
5 – 6 p.m.	Department of History, Political Science, and International Studies Awards	<i>Jones Chapel Common Room</i>
5:30 – 6:30 p.m.	Human and Environmental Sciences Awards	<i>Jones Chapel</i>
5 – 7 p.m.	Nutrition, Health & Human Performance CSA Day Award Ceremony	<i>CHESS Lobby</i>
5 – 7 p.m.	School of Natural and Mathematical Sciences Awards Ceremony	<i>SMB Atrium</i>
5:30 – 6:30 p.m.	Kappa Pi Art Honorary Society Induction Ceremony	<i>Gaddy Hamrick Courtyard</i>
5:30 – 7 p.m.	Office of International Programs Scholarship Award and Essay Contest Reception	<i>Kresge Auditorium</i>
6 – 8 p.m.	Music Department Student Award Ceremony	<i>Carswell Concert Hall</i>

Schedule of Events

MORNING CONFERENCE SESSIONS

MORNING POSTER PRESENTATIONS

Carlyle Campbell Library

8:30 – 9:15 a.m.

Effects of Delta-9-tetrahydrocannabinol (THC) Ingestion on Domesticated Canines

Mackenzie Bianchi

Investigating Bd and Bsal in Endemic Neuse River Waterdog (Necturus lewisi) Populations

Sophia Bogan and Juno Pilson

The Presence of Fecal Coliforms in Fast Food Ice

Madelyne Comley and Sophie LeClaire

Determination of the Presence and Characterization of Fecal Coliforms Found in Bodies of Water in Raleigh, N.C.

Jessica Crivello

How Do Hand Hygiene Strategies Affect Dermal Transmission of Staphylococcus aureus and Escherichia coli from Gym Facilities

Sariah Davis

The Reliability of Air-Displacement Plethysmography in Detecting Body Composition Changes After Water Ingestion and Creatine Supplementation

Reagan Doucette, Mary Catherine Driver, and Molly Surles

Antibiotic Resistance Found in Soil Samples

Charlotte Hemby and Elizabeth Parker

Fast Fashion's Negation of Cultural and Environmental Sustainability and The Lasting Impact on Minority Communities

Tiani Hinnant

Molecular Characterization of Alternatively Spliced Transcripts of alpha-synuclein as an Attempt to Establish the Differences of Functional Properties in Protein Isoforms with Respect to Synucleinopathy Etiology

Mackenzie Howell

The Synthesis of Oleanolic Acid and its Derivatives in Yeast Cell Cycles

Katie Juarez Olvera, Jakelin Santos Reyes, and Vanessa Jaimes Bustos

Neuromuscular Activity as a Function of the Performer's Focus

Arrianna May

Investigating Milk's Protective Influence on Probiotic Bacteria in Low pH Environment

Honeysa Patel

Image Processing Development of Coated Aluminum Corrosion
Kendall Putnam

Investigating Bd and Bsal in Raleigh, North Carolina Amphibian Populations
Kara Solomon

Investigation of Tetrahydrocannabinol (THC) Analogues in North Carolina
Clary Taylor and Peyton Vanada

Effects of Neighborhood-level Factors on Cardiovascular Disease Outcomes in North Carolina
Nyazjha Wilmer

Antimicrobial Resistance in Bacteria Isolated from Meat Products
Jada Zaragoza and Rothmila Tajrian

MORNING ORAL PRESENTATION SESSIONS

Music

Carswell Concert Hall

- 8:45 – 8:55 a.m. *A Beginner's Guide to Indian Classical Performance*
Taylor Liles
- 9 – 9:10 a.m. *Pride of Puerto Rican Music*
Roxy Rodriguez
- 9:15 – 9:25 a.m. *The Sounds and Dances of Eireann*
Leah Bryant
- 9:30 – 9:40 a.m. *The Tarantella*
Nora Hamel
- 9:45 – 9:55 a.m. *Rembétika in Greece*
Norah Shannon
- 10 – 10:10 a.m. *Japanese Music*
Natalie Wiese
- 10:15 – 10:25 a.m. *Early History of West African Highlife Music*
Nicole Flowers
- 10:30 – 10:40 a.m. *A History of Colombian Salsa*
Jordan Greenway
- 10:45 – 10:55 a.m. *Introduction to Cuban Music*
Olivia Martinez
- 11 – 11:10 a.m. *Memorable Melodies: The Intersection of Music and Mnemonics*
SarahElla Trustman

Design

Science and Math Building (SMB) 118

- 9:15 – 9:25 a.m. *Revitalizing Student Housing: A Case Study of Redesigning Student Housing and Lounge Spaces at Meredith College*
Claire Parker

- 9:30 – 9:40 a.m. *Reshaping Elegance: The Evolution of the Corsetry in Contemporary Fashion*
Jennifer Bruton
- Politics and Public Policy**
Science and Math Building (SMB) 162
- 9:15 – 9:25 a.m. *Exploring Health Outcomes, Food Security, and Resilience Strategies among Latinx Residents in N.C. High Country*
Anna-Moriah Fung
- 9:30 – 9:40 a.m. *Thematic Analysis: West Virginia v. Environmental Protection Agency and Subsequent Climate Policy*
Ashton-Brette Rusthoven
- 9:45 – 9:55 a.m. *A Machine Learning-Based Approach to Predict the User Engagement of a Tweet During an Election Season in Kenya*
Wanjiru Mambo
- 10 – 10:10 a.m. *The Evolution of Pro-Democracy Movements in China 1989-2014*
Danielle Dance
- Art History**
Harris 214
- 9:15 – 9:25 a.m. *The Duality of Love Within Caravaggio's Victorious Cupid*
Breonna Harris
- 9:30 – 9:40 a.m. *On Caravaggio's Boy with a Basket of Fruit*
Perla Gerez Hernandez
- 9:45 – 9:55 a.m. *Elevating Work; Vermeer's Lacemaker*
Rachel Smith
- 10 – 10:10 a.m. *Americans in Rome: Edmonia Lewis and Harriet Hosmer*
Sara-Rose Spann
- 10:15 – 10:25 a.m. *The Fan Bearers: Exploring Women's Roles as Models and Curators in Japonisme*
Avery Williams
- Gender and Sexuality**
Science and Math Building (SMB) 118
- 10 – 10:10 a.m. *Discerning and Living the Label: A Comparative Study of Sexual Identity Recognition and Expression in Heterosexually- and Non-Heterosexually-Identified Individuals*
Georgia Meade
- 10:15 – 10:25 a.m. *From Dionysus to Drag Race: A History of Genderqueer Expression in Theatre*
Sky Symonds
- 10:30 – 10:40 a.m. *Traditional Roles and Modern Constraints on Chinese Women*
Jordan Johnson

**Student Mental Health
Ledford 101**

- 10:15 – 10:25 a.m.** *Barriers to On-Campus Counseling for Meredith College Students Experiencing Symptoms of Anxiety and Depression*
Alexandria Crank
- 10:30 – 10:40 a.m.** *Moving for your Mind: The Effects of Movement Improvisation on the Mental Health of College Students*
Jordan Harrell
- 10:45 - 10:55 a.m.** *Stuck in the Mirror: Does a Mirror in Learning Choreography Affect the Mental Health of Dancers?*
Savannah Stainback

**Applications in Data Science
Science and Math Building (SMB) 162**

- 10:15 – 10:25 a.m.** *Examining Women's Health Equity with Machine Learning Techniques*
Emma Brooks
- 10:30 – 10:40 a.m.** *Forecasting Energy Stock Prices Utilizing Historical Data and Time Series Analysis*
Jessica Tan
- 10:45 – 10:55 a.m.** *Unlocking AI Potential in Bankruptcy Forecasting: Examining Artificial Intelligence's Efficacy with Altman's Z-Score Model with Publicly Traded Manufacturing Companies in the United States with Revenue Under \$500 Million Prior to 2020*
Madison Helton

AFTERNOON CONFERENCE SESSIONS

AFTERNOON POSTER PRESENTATIONS

Carlyle Campbell Library, Ground Floor

- 3 – 3:45 p.m.** *The Impact of the 2022 Dobbs Decision on Voting Behavior in the 2024 Presidential Election*
Bella Allen
- The Impact of Internship Experience on Individuals' Chosen Career Path and Identity Development*
Laura Beltran
- Embarking on a Francophone Expedition: Tracing Cameroon's Cultural Threads*
Nafissa Bia
- Effects of Applied Behavior Analysis Knowledge on One's Opinion of the Field*
Ruth Cates
- Reasons for Greater Interpersonal Relationship Quality During Periods of Prolonged Anxiety in Young Adults Aged 18-25*
Freya Dahlgren

How Bibliotherapy Can Be Used as a Healing Tool
Jessica Daugherty

The Relationship between Bilingualism and Communication Style in Conversation
Yakira Gonzalez

Evaluating Trust in Physicians with a QuantCrit Lens
Claire Jacoby

Classroom Management Strategies and Student-Teacher Relationships
Hadleigh John

Online Journaling and its Effects on Stress and Mood
Sarah Johnson

Exploring How Comfortable Undergraduate Students at Meredith College are Sharing Their Mental Health Concerns with Faculty and Staff
Brynn Oliver, Erica Buchheim, and Ellie Osborne

Investigating the Connection Between Perception and Cognitive Flexibility in Students at Risk for Anorexia Nervosa
Elisabeth Orlandini

Exploring Characteristics of Successful TikTok Influencer Partnerships in Audience Engagement: A Comparison of Two Prebiotic Sodas
Jenna Schroeder

Fear of Crime and Perceptions of Risk on College Campuses
Sara Shuller

Soundtracking Concentration: Investigating the Impact of Music on Attention and Distraction
SarahElla Trustman

AFTERNOON ORAL PRESENTATION SESSIONS

Ecology

Science and Math Building (SMB) 162

- 1:30 – 1:40 p.m.** *Utilizing City Bird to Calculate Species Vulnerability Indices for Triangle Area College Campuses*
Abigail McPherson
- 1:45 – 1:55 p.m.** *Potential Effects of Influx of Cooling Tower Water on Meredith College Lake Organisms: Examining Survivability of Water Flea, Daphnia magna*
Noelle Pearce
- 2 – 2:10 p.m.** *A Comparison of the Rates of Decomposition of House Mice (Mus musculus) Using Dermestid (Dermestes maculatus) and Darkling (Tenebrio obscurus) Beetles: What Stinks in SMB?*
Caroline (Callie) Klein
- 2:15 – 2:25 p.m.** *Student Perceptions on Gene Drives at Meredith College's Campus*
Alyshena Case

Effects on Learning
Ledford 101

- 1:30 – 1:40 p.m. *Interactions Between Language Experience and the Development of Language Prototypes*
Constance Wesley
- 1:45 – 1:55 p.m. *TikTok and its Effects on the Sustained Attention of College Students*
Kurstin Howe
- 2 – 2:10 p.m. *The Effect of Active Learning on Student Engagement*
Margaret Golliher
- 2:15 – 2:25 p.m. *The Effect of Acute Exercise on Cognitive Performance*
Shae-Lynn Henderson and Eliza Lewis

Literature and Culture
Harris 214

- 2 – 2:10 p.m. *Coiling Catalysts: Tracing the Alchemical Dragon's Visual Traditions*
Avery Williams
- 2:15 – 2:25 p.m. *Toxic Masculinity in The Great Gatsby*
Kelsie Nesselrode
- 2:30 – 2:40 p.m. *From Confines to Freedom: Location as a Reflection of Anne Elliot's Internal World and Emotional Development in Jane Austen's Persuasion*
Constance Wesley

Chemistry and Mathematics
Science and Math Building (SMB) 118

- 2:15 – 2:25 p.m. *Topology of the Universe*
Alexandra Cardoso-Garcia
- 2:30 – 2:40 p.m. *3D Printed Models of Electron and Molecular Geometry for Chemistry Education*
Emily Angel
- 2:45 – 2:55 p.m. *Investigation of Tetrahydrocannabinol (THC) Analogues in North Carolina*
Erika Vanada
- 3 – 3:10 p.m. *Synthesis of Fluorescein and its Derivatives*
Grace Stutz
- 3:15 – 3:25 p.m. *Development of a Process Oriented Guided Inquiry Learning (POGIL) Style Lab Activity Using Förster Resonance Energy Transfer (FRET)*
Sophia Bogan

ABSTRACTS OF PRESENTATIONS

THE TWENTY-SECOND ANNUAL MEREDITH COLLEGE UNDERGRADUATE RESEARCH CONFERENCE, 2024

The Impact of the 2022 Dobbs Decision on Voting Behavior in the 2024 Presidential Election

Bella Allen

*Research Advisor: Dr. David McLennan;
Arts and Humanities*

After almost 50 years of Roe v. Wade (1973) precedent the U.S Supreme Court made the decision to overturn Roe v. Wade, when they upheld the case of Dobbs v. Jackson Women's Health Organization (2022). About two months after Roe v. Wade was overturned, it was estimated during this time that about 58% of women in the United States of reproductive age lived in a state that was hostile to abortion rights. (Cordvale) After the U.S Supreme Courts Dobbs decision was made I saw the impacts this decision had on the United States political system. Specifically in North Carolina in which a 12 week ban decision was passed almost a year after the Dobbs decision was made. I become curious about how this 12 week ban decision would impact future North Carolinans' voting behavior in the upcoming Presidential Election. In order to find what was motivating voters in North Carolina, I analyzed their approval or disapproval of the 12 week abortion ban, their political party affiliation, their gender identity, their race, educational status, and geographic location within North Carolina. I wanted to boil down the question " Why do people vote?", and I wanted to ask " How much of an impact does the overturning of Roe v. Wade and the North Carolina 12 week abortion ban have on your voting behavior in the 2024 presidential election?". I hypothesized that voters who disapproved of the North Carolina 12 week ban were more motivated to vote in the 2024 presidential election.

3D Printed Models of Electron and Molecular Geometry for Chemistry Education

Emily Angel

*Research Advisor: Dr. Alexandra Ormond;
Natural Sciences*

Internships offer professional learning opportunities where students can work on real-world projects relevant to their subject of study or desired career path. Students can explore, improve their careers, and learn new skills during this time. The current study's goal was to demonstrate the relationship between internship experience and the current category of identity formation according to Marcia's theory of identity status. Students were expected to better understand the career they wanted to pursue and have developed a higher sense of identity achievement after completing an internship. Participants (N=7) completed a survey before and at the end of an internship experience with questions derived from the Development and Validation of the Occupational Identity Scale (Melgosa, 1987). These questions were rated on a 5-point Likert scale, with 1 being "strongly disagree" and 5 being "strongly agree." The second section of questions was adapted from a self-report instrument called the Objective Measure of Ego Identity Status (Adams et al., 1979). Statements were measured using a 6-point Likert scale, with 1 being "strongly disagree" and 6 being "strongly agree." Answers from both surveys were categorized into James Marcia's four identity statuses (i.e., foreclosure, achievement, diffusion, and moratorium). Due to the longitudinal nature of the design, we cannot yet make comparisons between the pre- and post-test measures. However, preliminary data shows that the majority of the participants fell under the identity status of moratorium.

The Impact of Internship Experience on Individuals' Chosen Career Path and Identity Development

Laura Beltran

*Research Advisor: Dr. Mark O'Dekirk;
Social and Behavioral Sciences*

Internships offer professional learning opportunities where students can work on real-world projects relevant to their subject of study or desired career path. Students can explore, improve their careers, and learn new skills during this time. The current study's goal was to demonstrate the relationship between internship experience and the current category of identity formation according to Marcia's theory of identity status. Students were expected to better understand the career they wanted to pursue and have developed a higher sense of identity achievement after completing an internship. Participants (N=7) completed a survey before and at the end of an internship experience with questions derived from the Development and Validation of the Occupational Identity Scale (Melgosa, 1987). These questions were rated on a 5-point Likert scale, with 1 being "strongly disagree" and 5 being "strongly agree." The second section of questions was adapted from a self-report instrument called the Objective Measure of Ego Identity Status (Adams et al., 1979). Statements were measured using a 6-point Likert scale, with 1 being "strongly disagree" and 6 being "strongly agree." Answers from both surveys were categorized into James Marcia's four identity statuses (i.e., foreclosure, achievement, diffusion, and moratorium). Due to the longitudinal nature of the design, we cannot yet make comparisons between the pre- and post-test measures. However, preliminary data shows that the majority of the participants fell under the identity status of moratorium.

Embarking on a Francophone Expedition: Tracing Cameroon's Cultural Threads

Nafissa Bia

*Research Advisor: Dr. Veronica Machelidon;
Arts and Humanities*

As the culmination of an independent study course in French, this presentation is the result of extensive research and exploration into the diverse cultural heritage of the Central African country of Cameroon. Attendees will be guided through an examination of Cameroon's ethnic groups and migration movements, contextualizing the country's cultural diversity within the broader narrative of colonization's lasting influence. Language emerges as a central theme, showcasing the diverse linguistic landscape that mirrors the complexity of Cameroonian society. Furthermore, a literary dimension will be introduced, featuring the poignant poetry of René Philombe, particularly his collection "Petite Gouttes de Chant pour Créer l'Homme," which offers profound insights into the human condition, with the themes of hypocrisy, hatred, racism, and xenophobia. Through Philombe's verses, we gain a heartfelt glimpse into the soul of the nation, as his words resonate with universal truths and timeless struggles. By considering these diverse perspectives, this presentation seeks to offer an authentic portrayal of Cameroon's cultural richness, celebrating its unique contributions to the global community.

Effects of Delta-9-tetrahydrocannabinol (THC) Ingestion on Domesticated Canines

Mackenzie Bianchi

*Research Advisor: Dr. Jessica Thorpe;
Natural and Mathematical Sciences*

In North Carolina, it is illegal to obtain marijuana, which is defined as Cannabis Sativa containing over 0.3% delta-9-tetrahydrocannabinol (delta-9-THC) according to the 2018 Farm Bill. Because of this, individuals are beginning to explore other types of products containing

less than 0.3% of delta-9-THC allowing domesticated animals access to delta-9-THC. Cannabinoids are metabolized differently in each species and there is little information about how they function within dogs, in which more research is needed. To explore these effects, a methodology was developed to extract and analyze delta-9-THC and its metabolites using HPLC from urine obtained from local animals who have ingested dog treats containing THC to determine how much THC is present within the sample and compare it to the pet's presenting symptoms.

Development of a Process Oriented Guided Inquiry Learning (POGIL) Style Lab Activity Using Förster Resonance Energy Transfer (FRET)

Sophia Bogan

*Research Advisor: Dr. Andrea Carter;
Natural and Mathematical Sciences*

The focus of this research is to develop a Process Oriented Guided Inquiry Learning (POGIL) style laboratory activity using the technique Förster resonance energy transfer (FRET), which can be used to determine the intramolecular distances in a protein. Utilizing a combination of techniques such as FRET, absorbance spectroscopy, and fluorescence spectroscopy is becoming more common in fields such as chemistry and biochemistry in order to observe the changes in protein structure during protein folding and unfolding. Therefore, implementing this technique in physical chemistry labs, such as the one at Meredith, can prove to be useful for students pursuing careers in these fields. This activity is in development in collaboration with colleagues from other institutions as part of the POGIL Physical Chemical Laboratory (POGIL-PCL) group (pogilpcl.org/). Towards this goal, we attempted to replicate a published lab from the Journal of Chemical Education that uses the protein cytochrome C, an electron transfer protein that plays an integral role in cellular respiration. In this process, we measured the unfolding curve of

the cytochrome C protein, determined the Förster distance between the heme group and Trp-59 using N-acetyl-tryptophanamide (NATA), a model tryptophan compound, and then calculated the intramolecular distances of the unfolded protein. As part of this process, appropriate modifications in the protocol were explored in order to use these lab techniques optimally at Meredith. Moreover, in adapting this lab protocol to the POGIL method, certain extensions and simplifications of the experiment are considered to improve the protocol for student learning.

Investigating Bd and Bsal in Endemic Neuse River Waterdog (*Necturus lewisi*) Populations

Sophia Bogan and Juno Pilson

*Research Advisor: Dr. Megan Serr;
Natural and Mathematical Sciences*

Amphibian populations have experienced significant declines in recent years due to a multitude of factors. One contributing factor has been chytridiomycosis resulting from infection with the fungal pathogens *Batrachochytrium dendrobatidis* (Bd) or *Batrachochytrium salamandrivorans* (Bsal). While Bsal has not yet been detected in North America, Bd has been recorded across the continent—including in North Carolina. The impact of Bd infection varies across species, and our research aims to address the lack of data on Bd infection, specifically in Neuse River Waterdogs (*Necturus lewisi*), a species of fully aquatic salamander endemic to the Neuse and Tar-Pamlico River Basins of North Carolina. Neuse River Waterdogs are one of the rarest species of salamander in the Southeastern United States, and they were declared a threatened species in 2021, granting them federal protection. Due to their declining numbers, assessing the susceptibility of Neuse River Waterdogs to Bd infection is crucial as no studies have yet been conducted on its effects. Our research aims to assess current Bd infection rates using dermal swabs. Each individual captured was swabbed for Bd and

Bsal. Additionally, biometric data (weight, snout-to-vent-length, etc.) and capture location were recorded for each individual. Bd and Bsal swabs were processed by the Student Network for Amphibian Pathogen Surveillance (SNAPS) program using qPCR to determine if Bd/Bsal were detected. So far, we have analyzed seventeen Neuse River Waterdogs swabs through this program. Our results indicated a need for further swabbing to gather more data points and examine the potential impacts of seasonality.

Examining Women's Health Equity with Machine Learning Techniques

Emma Brooks

*Research Advisor: Dr. Emily Lada;
Natural and Mathematical Sciences*

Breast cancer is a disease with varying severity and treatment options that mainly affects women. Triple negative breast cancer is one of the most aggressive forms of breast cancer, and it is crucial to diagnose and start treatment early to give the patient the best chance for recovery. The purpose of this research is to examine whether triple negative breast cancer patients have equal access to healthcare. One way to measure health equity is to examine the time it takes a patient to start treatment once diagnosed. Using data provided by Verity Health through the Women in Data Science Datathon, we will first use visualizations to examine relationships between the time until treatment and patient characteristics, such as drugs prescribed and the location of the metastasized cancer. Next, we will use machine learning techniques to predict the number of days between a patient's diagnosis and first treatment appointment based on characteristics of the patient and the area they live in. Multiple machine learning techniques will be used, including linear regression, decision trees, and random forests, and the accuracy of each model will be evaluated using a test dataset. We aim to identify the model that most accurately predicts a patient's time until treatment, as measured by the root mean

square error. We hope that the predictive models and our visualizations will help identify patient characteristics that are associated with longer treatment delays, thereby drawing attention to inequities in our healthcare system and leading to improved access for all women.

Reshaping Elegance: The Evolution of the Corsetry in Contemporary Fashion

Jennifer Bruton

*Research Advisor: Dr. Jessica Palmer;
Arts and Humanities*

The corset, a garment with a rich history, has undergone profound transformations in its cultural significance over time. This research delves into its multifaceted nature, examining historical perceptions, contemporary interpretations, and construction techniques, while also exploring its portrayal in various modern cultural contexts. Through archival research, textual analysis, and garment construction, this study investigates the corset's role as a symbol of femininity, societal status, and rebellion across different periods and cultures. It examines its portrayal in modern media, fashion, and subcultures, revealing shifts in attitudes towards this garment. Moreover, the research analyzes the corset's evolution as a cultural symbol, from representations of oppression to expressions of freedom. By merging historical construction techniques into contemporary fashion design, the study explores how the corset continues to influence the aesthetic and functional aspects of clothing. Ultimately, this research contributes to discussions on fashion, identity, and cultural symbolism by offering a nuanced understanding of the corset's impact on societal norms. It concludes with the creation of a modern corset, bridging the past with the present and providing insights into the future trajectories of this iconic garment.

The Sounds and Dances of Eireann

Leah Bryant

*Research Advisor: Dr. Demar Neal;
Arts and Humanities*

This presentation offers an insightful overview of the instruments and musical genres central to Irish dance. Highlighting various dance styles characterized by distinct time signatures, it provides a comprehensive exploration of Ireland's rich dance traditions. Delving into the historical evolution of instruments, from the ancient Irish harp to the contemporary button accordion, attendees gain a deeper understanding of the musical heritage underpinning Irish dance. By the presentation's conclusion, audience members will emerge with a nuanced appreciation for the diverse styles and historical significance of Irish dance music.

Topology of the Universe

Alexandra Cardoso-Garcia

*Research Advisor: Dr. Phillip Andreae;
Natural and Mathematical Sciences*

Is there a limit to the size of the universe? Is it possible to travel very far in one direction and return to our starting point? To answer these and other questions about the topology of the universe, researchers have gathered data through satellites that have been sent into space to gather information on Cosmic Microwave Background (CMB). Studying the CMB is one way that researchers may be able to discover the topology of the universe. Many methods have been used, and while the data researchers have collected are amazing, they have yet to lead to an answer.

The goal of this presentation is to introduce the main ideas of topology and to explain what we know about the topology of the universe today. The presentation is aimed for an audience who do not have advanced knowledge in the field of mathematics and physics. The presentation will begin by introducing basic topological concepts such as 2-dimensional and 3-dimensional manifolds. Then there will be a quick introduction to a few geometric spaces. Once we have covered

the mathematical background needed, we will explore CMB and its origin. This is crucial to understand the idea of matching circles that is the main point of this presentation.

Student Perceptions on Gene Drives at Meredith College's Campus

Alyshena Case

*Research Advisor: Dr. Megan Serr;
Natural and Mathematical Sciences*

The use of gene drives is where a scientist is able to manipulate certain genes in a population to affect the probability of that gene being given to future offspring. In the fall of 2023, an online survey was launched to assess undergraduate student familiarity and perceptions of this technology. Gene drives were chosen as our topic since it is a rapidly evolving field. As science progresses, this technique can be used to help solve specific healthcare and conservation problems. If we can determine familiarity and perceptions about gene drives, perhaps we can also bring more awareness to using gene drives and biotechnology in general. Initially, a literature review to determine whether current data on perceptions of gene drives was primarily quantitative or qualitative. This research was also used to help us design and conduct our survey. Our survey aimed to examine whether the overall perception of gene drive technology was positive or negative and how much baseline knowledge about gene drives was present within our student body. Data on background information and other demographics was collected to complete a data analysis. The data analysis examined correlations between students' perceptions of gene drives and their major and class status. Our most significant result is that students have an overall limited knowledge of what gene drives are but want to learn more. This data is essential to assess as it lets us know where students stand with important biological technology that could soon become a part of our lives.

Effects of Applied Behavior Analysis Knowledge on One's Opinion of the Field

Ruth Cates

*Research Advisor: Dr. Candalyn Rade;
Social and Behavioral Sciences*

Applied Behavior Analysis (ABA) is the science of behavior that can be used to help individuals with autism learn life skills (Kelly & Colon, 2022, p. 14). With growing practices and changes in empirical methods, the field of ABA has received some criticism and claims of lacking ethical parameters, making its application a hot topic of debate in recent years. Views of ABA may range based on personal experience, training, knowledge, and education. To that end, this study aimed to assess two hypotheses: 1) is there a positive relationship between someone's knowledge of ABA and their opinion about the ABA field; 2) and is there a positive relationship between someone's direct personal connection to ABA and their overall opinions of the ABA field. Data was collected thus far from 36 participants via an online survey measuring opinions of the ethical and effective nature of ABA, personal connection with ABA, and knowledge of ABA. Pearson's r correlations will be conducted to assess hypothesis one. A series of independent t -tests will be conducted to evaluate hypothesis two. It is anticipated that more knowledge of ABA will predict more positive opinions of the field. Additionally, I anticipate that those who have worked in the field will have a more positive opinion of the field while those who know someone who has received services may have mixed opinions. Data collection is ongoing and will be completed by mid-March. Final analyses will be conducted, with discussion of limitations and implications for the field moving forward.

The Presence of Fecal Coliforms in Fast Food Ice

Madelyne Comley and Sophie LeClaire

*Research Advisor: Dr. Susan Gardner;
Natural and Mathematical Sciences*

In fast food, it is common for certain equipment to facilitate bacterial growth if not cleaned or

maintained correctly. This experiment aimed to look at the quality of care taken for ice machines at six different fast food locations in the Raleigh, North Carolina, area. Fecal coliforms were the focus of the experiment using EMB plates, which are selective for gram-negative bacteria. Fecal coliforms were of interest because they signal bacterial contamination. While they are not known as disease-causing bacteria, they can signal the possibility of other bacterial presence that can cause disease. Ice was collected on Thursday mornings and afternoons each week for 4 weeks. Ice was left to melt for about 24 hours prior to filtering. Through multiple trials, the EMB plates showed no growth, meaning it could not be concluded that fecal coliforms were present in the ice. This showed that the fast food restaurants being tested were cleaning their equipment correctly, preventing the spread of disease.

Barriers to On-Campus Counseling for Meredith College Students Experiencing Symptoms of Anxiety and Depression

Alexandria Crank

*Research Advisor: Dr. Betty-Shannon Prevatt;
Social and Behavioral Sciences*

Student attitudes and perceptions surrounding mental health treatment on college campuses heavily influence use of on-campus mental health facilities by college students (Çebi & Demir, 2020; Shea et al., 2019; Ebert et al., 2018; Jennings et al., 2017). With the recent rise of mental health issues in the college-aged population, this study sought to better understand the barriers to mental health services at a small, liberal arts, women's college (Holtz et al., 2020; Shea et al., 2019). Participants ($N=120$) completed an online survey assessing demographic characteristics, general attitudes towards mental health treatment, symptoms of depression and anxiety, and perceptions of the campus Counseling Center. Qualitative analyses indicated mixed results, with some participants describing positive perceptions of or experiences with the Counseling Center, some

describing negative perceptions or experiences, and some describing both negative and positive perceptions and experiences. To overcome these attitudinal barriers to care, more information about the benefits of mental health counseling, Counseling Center services, staff, and protocols should be made available to students so they can better understand the strengths and limitations of services available to them and ultimately increase use.

Determination of the Presence and Characterization of Fecal Coliforms Found in Bodies of Water in Raleigh, NC

Jessica Crivello

*Research Advisor: Dr. Susan Gardner;
Natural and Mathematical Sciences*

Fecal coliforms are bacteria that are typically associated with the feces of warm-blooded animals, including humans. They are frequently found in bodies of water and most do not cause disease, although in high enough numbers they can cause illness. These bacteria serve as indicators for possible fecal contamination as well as the presence of pathogenic bacteria and potentially antibiotic-resistant bacteria in bodies of water. Certain strains of coliforms are more dangerous than others, so by testing bodies of water for the presence of coliforms, we can then determine if pathogenic bacteria are present. There are guidelines that indicate safe levels of fecal coliforms that depend upon factors such as movement of water and water temperature. The goal of this study is to determine the presence of coliform bacteria found in bodies of water in Raleigh, NC and to determine if these bacteria are also antibiotic-resistant. By characterizing these bacteria, we can demonstrate evidence of antibiotic-resistance in the environment where people and animals may converge.

Reasons for Greater Interpersonal Relationship Quality During Periods of Prolonged Anxiety in Young Adults Aged 18-25

Freya Dahlgren

*Research Advisor: Dr. Teresa Holder;
Arts and Humanities*

It is widely known and researched that social support is helpful when individuals face periods of anxiety (Adler & Proctor, 2016). What factors influence one's feelings of greater interpersonal relationship quality with parents and friends when experiencing self-reported anxiety? Through a series of interviews, this study aimed to address this question and examined reasons for greater reliance on relationships when experiencing anxiety. There were 12 participants in the interview process and each interview took between 15 and 45 minutes to complete. The findings suggested that reasons for closeness with friends were understanding/similar experiences, self-disclosure, and support. The main reasons for distancing from friends were due to the interviewee feeling like a burden, experiencing isolation, and not feeling understood. The main reasons for closeness with parents were communication, helpfulness from parents and having them as a resource, active efforts from parents in the relationship, self-disclosure, and comfort, and the main reasons behind distancing from parents when experiencing anxiety were feeling closer to one parent over the other, lack of parental understanding, choosing not to openly talk to parents about deeper topics, judgment, and not wanting to worry them. Additional themes were interdependence, open communication (vulnerable communication about deeper or more difficult topics), isolation, closeness during anxiety, and a willingness to do things. The findings of the study supported Adler and Proctor's earlier research on the value of interpersonal relationships in managing anxiety.

The Evolution of Pro-Democracy Movements in China 1989-2014

Danielle Dance

*Research Advisor: Dr. Jeffrey Martinson;
Arts and Humanities*

Internal pro-democracy protest movements around the globe have resulted in laws being enacted, changed how governments function, and brought global awareness to what is going on in those countries. Protests in post-Mao China have happened for many years in multiple cities, two examples of which are the 1989 Tiananmen Square Protest in Beijing and the 2014 Umbrella Movement in Hong Kong. Three dynamic components involved in Chinese protests have been state authority, popular resistance, and global audience. I analyzed these three components of protest in the 1989 and 2014 cases. I find that their nature and impact have evolved in several ways between the 1989 and 2014 protests. From 1989 to 2014, the use of social media and protective gear were major factors in the Umbrella Movement. However, there was an increased use of censorship from the Mainland Chinese government. In the 1989 Tiananmen Square protest, the state authority used extreme force to end the protest. In both protest movements, the state authority was successful in their goals of condemning and ending the protest. In terms of popular resistance, the population was unsuccessful in their goals of creating change; however, they were able to get the global audience to support their movements.

How Bibliotherapy Can Be Used as a Healing Tool

Jessica Daugherty

*Research Advisor: Dr. Pamela Norcross;
Child Development*

Coping with a parent's serious illness can be challenging for young children, causing stress and strong feelings that are hard to process. Often, children are left out of conversations around the parent's illness, usually due to adults not knowing what to say, wanting to "protect" children from feeling scared, or assuming

they will not understand, which then leads to children coping with their parent's illness by themselves.

Bibliotherapy, defined as using books and literature as a therapeutic tool for education and coping, can be a great tool for parents to use when having serious conversations about a parent's illness. Bibliotherapy can be used to educate children on illness, treatment, and coping. When children are left to learn about information on their own, they often make up inaccurate information, and are left feeling scared and isolated. However, despite good intentions, children's books that focus on a parent's serious illness vary in their therapeutic content, such as wording being vague, using fantasy storytelling, using incorrect information, and partial descriptions, rather than providing accurate, clear explanations that help educate children.

This project was a qualitative design to examine the content of children's books with a thematic analysis methodology. Thirty-nine children's books were transcribed, each text coded, and examined for emerging themes. Two major themes emerged in the texts: 1. education on illness and treatment, and 2. dialogue around illness and treatment, but without a therapeutic focus. Knowing what books are best for therapeutic intervention to offer the best education for children is essential.

How Do Hand Hygiene Strategies Affect Dermal Transmission of Staphylococcus aureus and Escherichia coli from Gym Facilities

Sariah Davis

*Research Advisor: Dr. Susan Gardner;
Natural and Mathematical Sciences*

The purpose of this study is to determine the significance of proper hygiene by comparing thorough hand washing, hand sanitizer use, or no hand washing and no sanitizer use before and after working out in a gym. The study will be looking for the presence of potential pathogenic bacteria such as Staphylococcus

aureus and Escherichia coli in public gym settings. The objective of the study is to compare bacteria from two different workout facilities. The observations and bacterial collection will take place at Meredith College Lowery Fitness Center and North Carolina State Wellness Recreation.

The Reliability of Air-Displacement Plethysmography in Detecting Body Composition Changes After Water Ingestion and Creatine Supplementation

Reagan Doucette, Mary Catherine Driver, and Molly Surles

Research Advisor: Dr. Edward Robinson; Natural and Mathematical Sciences

The purpose of this study is to utilize air-displacement plethysmography (ADP) technology to determine the rapid gains in body mass following changes in hydration status due to water composition and creatine loading. Water consumption results in fluid being primarily in the stomach and bladder, while creatine supplementation results in water retention; therefore, this study analyzes how changes in body composition result from two different methods of hydration manipulation. Methods: Two full body composition/volume analyses were performed utilizing lung volume measurements following a 6-12 hour fasting period. Subjects then began a creatine supplementation regime requiring them to consume 5.25g of creatine monohydrate four times per day (21g/day) for seven days. Subjects underwent the same analyses at approximately the same time of day. Results: According to the data collected, there was a statistical significance in body volume, body weight, and fat mass between the subject's initial measurements and after their rapid water intake; however, there were no statistically significant values found for the creatine measurements. Conclusion: While many participants demonstrated a difference between their initial, rapid water, and creatine measurements, not all data was determined to be statistically significant. As a result of this study, we know to utilize fat-free mass to

calculate accurate values on subjects who have consumed water prior to Bod Pod testing. This is because water only affects an individual's weight and not their fat mass.

Early History of West African Highlife Music

Nicole Flowers

Research Advisor: Dr. DeMar Neal; Arts and Humanities

This presentation aims to unravel the rich tapestry of the early history of West African highlife music. It explores the geographical locations, cultural origins, distinctive instruments, and formative genres that laid the groundwork for this vibrant musical tradition. Through an in-depth examination of historical contexts and musical influences, attendees will gain insights into the diverse cultural landscapes from which highlife music emerged. By the conclusion of the presentation, audience members will not only have a comprehensive understanding of the foundational elements of early highlife music but also a deeper appreciation for its cultural significance and enduring legacy.

Exploring Health Outcomes, Food Security, and Resilience Strategies among Latinx Residents in N.C. High Country

Anna-Moriah Fung

Research Advisor: Dr. Rebecca Hagedorn-Hatfield; Natural and Mathematical Sciences

Rates and degree of food insecurity (FI) and FI-related health outcomes are exacerbated in rural Latinx populations by various social and socioeconomic factors, including language proficiency, access to nutrition assistance and education, and various adaptive mechanisms. Adapting federal and community resources to the needs of this population to increase participation can help reduce negative health outcomes and FI. Participants (n=179) from the NC High Country completed a survey on health, FI, use of food assistance (FA), and coping strategies. The most common health outcomes

were obesity (40.2%) and anxiety (33.0%). A majority (77.8%) experienced symptoms of at least one disease state. A majority of participants (53.1%) were categorized as food insecure. 49.5% of the sample used federal FA programs, 52.8% used food pantries, and 36.9% used additional community FA programs. Food insecurity and the use of federal FA were predictive of experiencing a health outcome (OR 3.29, 95% CI: 1.07-10.07; OR 0.58, 95% CI: 0.38-0.91). When controlling for language, only the use of federal FA remained significant, showing a 42% decrease in the odds of at least one negative health outcome with each additional federal FA program used. In conclusion, federal FA participation was found to be protective against negative health outcomes. However, use of community FA programs was more common among this sample, indicating a need to help Latinx communities overcome barriers to federal FA program use.

On Caravaggio's Boy with a Basket of Fruit

Perla Gerez Hernandez

*Research Advisor: Dr. Beth Mulvaney;
Arts and Humanities*

The Italian Baroque artist Caravaggio is known for the use of non-traditional imagery, the heavy reliance on models as a reference for paintings, the naturalist use of color, and the dramatic use of light and shade. His early work, paintings such as *Boy with a Basket of Fruit* (c. 1593), *Youth bitten by a Green Lizard* (c. 1594), and *The Lute Player* (c. 1596), depicted young boys and still lifes of flowers, fruits, and instruments. Sixteenth-century Italian critics criticized the stillness of Caravaggio's figures, his dependence on visual reference, and the lack of background of his paintings that were characteristic of his early work because they believed this demonstrated a lack of imagination. In his painting, *Boy with a Basket of Fruit* (c. 1593), Caravaggio transcends the mundane qualities associated with still lifes and genre scenes. While scholars focus on the

sexually suggestive nature of the painting, I will focus on his use of light, shade, color, and symbolism to create a tension between vitality and mortality. I will argue that the painting presents a visual antithesis between the naturalist depiction of the decaying fruit and the blemishless skin of the model being portrayed. Through research and analysis of Caravaggio's portrayal of youth, and the portrayal of fruit and in his paintings, the patronage under which the painting was created, and the symbolism of fruits in late sixteenth-century baroque art and literature, I will provide a further understanding of the symbolism in the painting *Boy with a Basket of Fruit*.

The Effect of Active Learning on Student Engagement

Margaret Gollither

*Research Advisor: Dr. Cecilia Toole;
Social and Behavioral Sciences*

This study explores the impact of active and passive learning on student engagement. Active learning places the responsibility for learning on students while educators facilitate, whereas passive learning leaves educators responsible for student learning. Student engagement is a critical factor in student achievement, making it important to understand the learning process that best supports it. The study involved observations of first-grade students as they participated in multiple active and passive learning experiences. The researcher gathered data on student engagement during multiple sessions of each lesson type. Observations showed that active learning strategies resulted in student engagement more often through more occurrences of on-task behaviors than occurred during passive lessons. The results of this study can help educators understand why it is important to implement active learning strategies in classrooms to boost student engagement and subsequently student achievement.

The Relationship Between Bilingualism and Communication Style in Conversation

Yakira Gonzalez

*Research Advisor: Dr. Mark O'Dekirk;
Social and Behavioral Sciences*

Gesturing has been shown to play a crucial role in human communication (Frick-Horbury & Guttentag, 1998). The present study compared levels of self-reported language proficiency (monolingual vs. bilingual) on the amount of filler words and gestures used when conversing. The aim of the study was to demonstrate if monolingual individuals (English speaking only) will gesture and use filler words more than bilingual individuals (English and Spanish speakers). Participants (N=16) were divided into two groups depending on if they spoke English only or English and Spanish. Using a 7-point Likert scale, participants who spoke both English and Spanish were asked to assess their degree of proficiency in both languages. Participants were then read a short story (The War of the Ghosts; Bartlett, 1932) that contained significant detailed information. Participants were then asked to retell as many details as they could remember about the story while being videotaped. The variables that the study examined were their use of "filler words" (e.g., like, and then, so, um) and their use of gesturing when attempting to recall information from memory. Data collection is ongoing, but preliminary data (N = 16) suggests no differences between the two groups in terms of the number of filler words used between monolinguals and bilinguals (e.g, "and then"). Also, there appears to be early evidence that monolingual subjects utilized more gesturing when retelling the story than bilinguals, however due to the large amount of variability in the data the difference was not statistically significant.

A History of Colombian Salsa

Jordan Greenway

*Research Advisor: Dr. DeMar Neal;
Arts and Humanities*

This presentation delves into the captivating history of Colombian salsa. It explores the evolution of this musical genre, tracing its journey from its early days characterized by dark and melancholic undertones to its vibrant and dynamic contemporary form. Emphasis is placed on unraveling the profound impact of Cuban influences on Colombian salsa, showcasing the fusion of cultural elements that have contributed to its rich tapestry. Through a detailed examination of historical shifts, cultural influences, and notable personalities, this presentation offers a comprehensive insight into the multifaceted evolution of Colombian salsa, portraying it as a dynamic and influential musical phenomenon.

The Tarantella

Nora Hamel

*Research Advisor: Dr. DeMar Neal;
Arts and Humanities*

The Tarantella dance of Italy is a lively folk-dance originating from Puglia. Puglia is the region in Italy known as the "heel of the boot" because it is located at the southeast point. The dance stems from women who believed they were bit by a spider known as the Tarantola. Dancing Tarantella for long hours (for up to a few days) was believed to heal the poisonous bite. Today, the Tarantella dance is widely used in Italy and is arguably the most famous folk tradition. Through an examination of the history, culture, and musical features, attendees will gain new information about this culture's folk traditions and learn about the musical aspects of Tarantella music.

Moving for Your Mind: The Effects of Movement Improvisation on the Mental Health of College Students

Jordan Harrell

*Research Advisor: Dr. Carol Finley;
Arts and Humanities*

Movement improvisation has been found helpful for relaxation, socioemotional learning, to boost the mood of students, to connect the mind and body, and for students to have more agency over their dancing and performance skills. Additionally, movement therapists use movement improvisation to help heal those impacted by trauma. With this study, I want to ask students who are enrolled in the movement improvisation class here at Meredith what their mental state is before and after doing multiple sessions of improvisation. I want to learn if movement improvisation helped their stress level, mood, and body tension, as well as any symptoms of mental illness they might have. My hope is that with this research, I can encourage teachers to use movement improvisation with their students to help with mental health.

The Duality of Love Within Caravaggio's Victorious Cupid

Breonna Harris

*Research Advisor: Dr. Beth Mulvaney;
Arts and Humanities*

Caravaggio, the renowned Italian Baroque artist, shocked many with his naturalistic and provocative depiction of Cupid in the painting *Victorious Cupid* (c. 1602). Legs spread with a playful grin and flushed cheeks, Cupid stands triumphantly and completely nude over symbols of seventeenth century authority and intellectualism, such as armor, a crown, and mathematical tools. Holding two arrows and wielding a bow with a broken string, the Cupid on display in *Victorious Cupid* demonstrates love's irreverence for humanity and encourages one to question their understanding of love itself. Commissioned by Marchese Giustiniani, a prominent and affluent art collector in Italy, Caravaggio's controversial Cupid was widely considered the best work in Giustiniani's

collection. The painting was considered so sensational that it was hidden behind a curtain in Giustiniani's home. While the concealment of the painting was partially done to protect the modesty of women, it was also said to have been done to avoid overshadowing the other works in the collection. Typically portrayed as an infantilized putto, this adolescent and unidealized Cupid shows Caravaggio's rejection of tradition and his desire to explore the relationship love has with humanity. While many scholars have focused on the nudeness and the consequential homoerotic themes of the mischievous Cupid, I will instead examine Caravaggio's use of contrasting imagery within the work and how it reflects an equally dual natured and conflicted portrayal of love. Specifically, by analyzing and comparing traditional depictions of putti to Caravaggio's Cupid, exploring Cupid's confident yet oblivious body language and facial expression, and investigating the symbolism of Cupid's arrows and broken bow, I will make clear how Caravaggio is attempting to construct an unconventional paradigm of love. In so doing, I will establish how Caravaggio and his work, *Victorious Cupid*, redefine and call into question love's role, prominence, and power over humanity.

Unlocking AI Potential in Bankruptcy Forecasting: Examining Artificial Intelligence's Efficacy with Altman's Z-Score Model with Publicly Traded Manufacturing Companies in the United States with Revenue Under \$500 Million Prior to 2020

Madison Helton

*Research Advisor: Dr. Brian Routh;
Business/Accounting/Finance*

Recent years have seen the rise of artificial intelligence (AI) in various industries, and AI has begun streamlining many job functions. The accounting industry has seen the rise of AI within audit, decision-making, and data analytics. This new disruptive technology is causing concern for many accountants and

financial analysts who fear AI may evolve into a technology that could overtake their jobs. However, as AI grows increasingly more popular in job functions, many people are becoming more concerned about reliability, as artificial intelligence has often provided inaccurate facts, outdated information, and biased results. One way that AI has evolved in the workplace is as a data analysis tool. Generative AI technology, like ChatGPT, can take a data set and analyze the data however the user specifies. The user could have generative AI run analysis on financial data and determine profitability and liquidity ratios, trend and risk analyses, and forecasting. One area of analysis that concerns many financial analysts and stockholders is bankruptcy analysis. This research seeks to determine if generative AI can predict bankruptcy using Altman's Z score model for publicly traded manufacturing companies in the United States, prior to year 2020, with annual revenues under \$500 million. To achieve this, balance sheets, income statements, and 10-k forms undergo Altman's Z-Score analysis through ChatGPT. The subsequent results are then compared to an Altman's Z-score analysis performed by a human. Then, by comparing the two analyses, we can determine if AI can accurately predict bankruptcy in this sector.

Antibiotic Resistance Found in Soil Samples

Charlotte Hemby and Elizabeth Parker
Research Advisor: Dr. Susan Gardner;
Natural and Mathematical Sciences

Antibiotic resistance is on the rise for many different reasons. Outside of medical settings, bacteria in different environments are showing signs of antibiotic resistance. The Small World Initiative has made many contributions to antibiotic resistance. One of the missions is to encourage students to pursue research and careers in antibiotic resistance. In this research, we are focusing on bacteria found in different soil samples and their antibiotic and antimicrobial properties. Data has been collected in Raleigh, North Carolina with

four different sights. Through different tests including colony isolation (T-streaking) and a PCR test, the goal is to find what bacteria is commonly found in the soil samples and if it contains any antibiotic and antimicrobial properties.

The Effect of Acute Exercise on Cognitive Performance

Shae-Lynn Henderson and Eliza Lewis
Research Advisor: Dr. Candalyn Rade;
Social and Behavioral Sciences

The effect of acute exercise on cognitive performance is a growing field of research. As it currently stands, it is a relatively broad field of study that looks across many demographics including age, fitness, health, and more. As a result, findings have yielded mixed results and limited understanding with regards to the potential benefit and even detrimental effects of acute exercise on cognitive performance for given tasks. Cognitive performance also varies widely but is categorized across attentional allocation, inhibitory control, and cognitive flexibility. There are several means for defining and testing cognitive performance, with the Flanker Test and Stroop Test being two prevalent measures used across multiple studies. With a suspected gap in research with regards to college athletes and cognitive performance after exercise, a sample of 16 Meredith College athletes across the Field Hockey and Softball teams were recruited to participate in a pre-exercise and post-exercise Stroop Incongruent Test to measure the impact of physical activity on performance in a neuropsychological assessment designed to measure executive function and multiple cognitive processes. Results indicated that post-test times were significantly lower than pre-test times which aligns with the proposed hypothesis that engaging in acute physical activity improves cognitive performance. Testing continues and results will be updated. While these results supported the hypothesis, this experiment acts as a foundational layer and limitations such as smaller sample size,

potential self-selection bias, and participation in different activities across the teams may influence results.

Fast Fashion's Negation of Cultural and Environmental Sustainability and The Lasting Impact on Minority Communities

Tiani Hinnant

Research Advisors: Dr. Jessica Palmer and Dr. Hyojung Cho; Social and Behavioral Sciences

According to James (2022), The Fast fashion industry "[seeks] to bring the newest trends to consumers at the lowest prices possible." (p. 247-248) and is known for having thousands of new styles presented to consumers weekly (Kluth, 2022, p. 787). In recent years, the fashion industry has also been known for many negative and unethical practices. Many of these practices fall into the realm of culturally unsustainable, and they include design piracy, child labor, and environmental harm. It is important to highlight the areas within cultural sustainability where the fast fashion industry falls short because fast fashion affects our world. The fashion industry has one of the biggest global carbon footprints and fast fashion's wasteful nature is a major contributor to that (Kluth, 2022 p.788) This literature review can shed light on the unethical practices of an entire industry and spread awareness of a problem affecting many people.

The focus of this review will include highlighting the practices of the fashion industry that fall into the category of culturally unsustainable and show the intersection of fast fashion's unsustainable practices with minority communities. The criteria used for selecting literature for this review included nine peer-reviewed journal articles that defined the fast fashion industry and cultural sustainability, described ways fast fashion has not been sustainable and tied the fast fashion industry to cultural and environmental sustainability.

TikTok and its Effects on the Sustained Attention of College Students

Kurstin Howe

Research Advisor: Dr. Mark O'Dekirk; Social and Behavioral Sciences

Academic performance requires one to give their undivided attention for various tasks. Research has shown that academic performance in college students can be negatively impacted by social media usage when used for social reasons (Lau, 2017). This study investigated the effect of TikTok on one's sustained attention span. Participants (N = 22) were traditionally aged college students who completed one of two tasks (watching TikTok for 10 minutes vs. watching a 10 minute TedTalk video). They then completed a 30-minute (1200 trials) sustained attention task where each trial consisted of a number presented on a computer screen that increased by one number on each successive trial. Occasionally, the number would skip two places rather than the expected one place. This event was considered the "target event" where the subjects were required to press the spacebar as fast as possible. The dependent variable was measured in average response times to the target event (msec) and the percentage of trials with a mistake (a missed target or a false positive response). The results were broken into three periods of time; 0-10 minutes (Block 1), 11-20 minutes (Block 2), and 21-30 minutes (Block 3). I predicted that using TikTok will result in an increased reaction time and more errors compared to watching a TedTalk video. Results for the TedTalk group showed significantly slower responses and significantly more errors as the task continued. There were no significant differences for the TikTok group.

Evaluating Trust in Physicians with a QuantCrit Lens

Claire Jacoby

Research Advisor: Dr. Candalyn Rade;
Social and Behavioral Sciences

Many factors, including trust in their physician, may serve as barriers to birthing peoples' disclosure of their mental health symptoms during the perinatal period (Bell et al., 2011). This may be especially apparent in the US, where financial poverty is a predictor of postpartum depression (Segre et al., 2007). People of minority races face unique barriers to disclosing symptoms, such as fear of social service involvement (Adlington et al., 2023), or racism (Mishra et al., 2009). Quantitative Critical Race Theory (QuantCrit) emphasizes disaggregating racial categories to avoid masking important differences, which may occur when heterogeneous groups are treated as uniform (Castillo & Gillborn, 2023). Thus, the current study explores the use of QuantCrit to examine the relationship between trust in physicians, income level, and race. Participants (N = 125) were birthing people recruited from a multi-site study assessing prenatal care. Data were collected at six-weeks postpartum from all participants via online survey. Consistent with QuantCrit tenants, nonparametric statistical analyses were employed to examine physician trust scores across the different racial and income categories. A Kruskal-Wallis Test revealed no significant differences in physician trust between any of the five racial groups ($p = .508$), nor between income categories ($p = .699$). Findings raise questions about who trusts their physician and willingness to disclose symptoms or participate in studies. The reported analyses are preliminary and the analyses will be repeated prior to the conference to allow for inclusion of more participants.

Classroom Management Strategies and Student-Teacher Relationships

Hadleigh John

Research Advisor: Dr. Andrea McPherson;
Social and Behavioral Sciences

It is important to analyze how student-teacher relationships and classroom management strategies may be related because a positive classroom climate correlates with student's academic performance and social competence (White & Vossler, 2023). A positive classroom climate might reflect the overarching quality of dyadic student-teacher relationships (Rucinski et al., 2018). The present study researched the relationship between how a teacher rates their student-teacher relationship with a particular student who often exhibits problem behaviors, how effective they rank their classroom management strategies in regards to that student's problem behaviors, and how frequently they use these strategies for that particular student. Teachers were asked to complete a survey containing six strategies from the Classroom Management Strategies Questionnaire. Teachers were asked to state the effectiveness of the strategies for decreasing their particular student's problem behaviors. In addition to stating the effectiveness of these strategies, the teachers were also asked to state the frequency that they use those strategies for their particular student. Additionally, the teachers were asked questions pertaining to their relationship with that particular student. After completing the survey, the participants' effectiveness, frequency, and student-teacher relationship scores were compared. Preliminary results associated with perceived relationships along with classroom management strategies will be presented. Findings from this study can be used to help teachers reflect on their relationships and the classroom management strategies they use.

Traditional Roles and Modern Constraints on Chinese Women

Jordan Johnson

*Research Advisor: Dr. Angela Robins;
Arts and Humanities*

This presentation will consider how traditional gender roles, influenced by filial piety, a concept dating to Confucius, have constrained women and feminist activists in China's Modern period (1980s-present.) Confucian ideology has persisted throughout Chinese history and has adversely affected women, most notably in the practices of widow chastity and footbinding. Under Mao (1949-1976) and communism, religion was ousted as one of the four "olds". The "olds" were concepts from pre-communism that Mao and his government wanted to abolish, giving women an illusion of gender equity. However, we see the re-emergence of Confucian ideology in the late 70s and early 80s, as the country left communist policies behind. Various primary and secondary sources allow an examination of the evolving societal expectations of women in Chinese history, and help explain why modern Chinese women and feminist activists have consistently faced setbacks in advocating for themselves, including ongoing oppression of women under current president Xi Jinping's government.

Online Journaling and its Effects on Stress and Mood

Sarah Johnson

*Research Advisor: Dr. Andrea McPherson;
Social and Behavioral Sciences*

This study explores the potential benefits of online journaling on an individual's stress and mood, specifically focusing on the impact of online engagement through comments and how that can improve stress and mood. Twenty-two undergraduate students (N=22) were asked to complete a modified version of The Brief Perceived Stress Questionnaire (BPSQ; Cohen, Kamarck, & Mermelstein, 1983), a global measure of perceived stress as a pretest. After the pretest, groups were split into a control group and experimental group.

The control group participants were given a prompt to talk about their day, whereas the experimental group was given the same prompt but then asked to comment and read others' prompt responses. At the end of each day, both groups were asked to complete the same BPSQ. The researcher hypothesized that the experimental group would show a lower post BPSQ score showing that they had lower stress levels after reading and responding to others journal entries. The study was initially planned for seven days; however, due to technical error, this was limited to three. Given observations made by the researcher, dropoff percentages for each group were calculated to gauge overall participation. The experimental group had the highest dropout rate (drop out rate=54%). The control group also had a noticeable percentage of dropouts (drop out rate=27%); however, the impact was less compared with the experimental group. Given these numbers, the data from day one was deemed the only usable data from both groups. Analyses are currently ongoing; a paired samples t-test will be used to look at the difference in perceived stress across the control and experimental groups. This research is hoped to provide support for the use of communication collaboration in journaling to reduce stress and anxiety in individuals.

A Comparison of the Rates of Decomposition of House Mice (*Mus musculus*) Using Dermestid (*Dermestes maculatus*) and Darkling (*Tenebrio obscurus*) Beetles: What Stinks in SMB?

Caroline (Callie) Klein

*Research Advisor: Dr. Megan Serr;
Natural and Mathematical Sciences*

Dermestid beetles (*Dermestes maculatus*) and Darkling beetles (*Tenebrio obscurus*) are species of flesh-consuming beetles that are often used by hobbyists and museum research staff for their ability to quickly and effectively skeletonize animal remains. Despite their widespread use as a beginning step in taxidermy and specimen preparation, there was no known study that directly compares the skeletonization rates between the two beetles. This study established

a quantitative and qualitative comparison between the two beetles as a way to evaluate which would be best suited for taxidermy and skeleton preparation. For this study, we created trials in which each species of beetle was evaluated on the time in which they were able to skeletonize the carcasses of house mice (*Mus musculus*). Based on the continuous monitoring on an adapted scale of decomposition, as well as with weekly weight recordings, we were able to provide evidence that demonstrated dermestid beetles as the most effective choice for skeletonizing specimens quickly. However, despite their high rate of skeletonization, the dermestids would sometimes continue to feed after skeletonization was complete. They would damage the bone tissue and in many cases, destroy it completely. With that being said, it would be recommended for the darkling beetles to be used with smaller specimens to prevent bone damage. Additionally, Darkling beetles can be purchased at a lower cost, making them a more accessible option for beginners and hobbyists. This study was an important step in identifying differences between the two species in terms of skeletal preparation.

A Beginner's Guide to Indian Classical Performance

Taylor Liles

*Research Advisor: Dr. DeMar Neal;
Arts and Humanities*

This presentation serves as an introductory exploration of Indian classical performance, designed to cater to beginners. It delves into India's rich cultural heritage, highlighting the intricate rhythms, melodious tunes, and diverse instrumentation that characterize various classical forms. By offering a comprehensive guide, it aims to spark curiosity and foster a deeper appreciation for Indian Classical Music among attendees. Through this journey, participants are invited to immerse themselves in the mesmerizing sounds and traditions that define this timeless musical genre.

A Machine Learning-Based Approach to Predict the User Engagement of a Tweet During an Election Season in Kenya

Wanjiru Mambo

*Research Advisor: Dr. Emily Lada;
Natural and Mathematical Sciences*

General elections in Kenya are often an intense time that generate many conversations across different platforms, including X (previously Twitter). Kenyans use X during election seasons to express their views on different political and socio-economic issues. As such, X can provide insights into the attitudes Kenyans have regarding certain issues during an election year. The purpose of this research is to determine the main topics Kenyans were discussing on X as they prepared for the 2022 general election. Using a dataset available on Kaggle, an open source platform for data science enthusiasts, we first apply data visualization techniques to explore tweet characteristics, such as number of followers. We then use text pre-processing methods to prepare the text of the tweets for topic modeling, an unsupervised learning technique within Natural Language Processing that groups words in a body of text into broader topics. Ultimately, a new variable is added to our dataset that contains the topic of each tweet. Finally, we use the topic modeling results and other key variables to build a machine learning model to predict the user engagement of a tweet, which is measured as a function of the number of likes and retweets. We hope the results of this research can provide guidance to Kenyan political leaders on how to tailor political messages to accurately address the concerns of Kenyans in the next election season.

Introduction to Cuban Music

Olivia Martinez

*Research Advisor: Dr. DeMar Neal;
Arts and Humanities*

Cuba is one of the most important countries within Latin America for music, and has influenced the creation of music worldwide. Embedded in daily life and history, Cuban music carries deep African roots, tracing

back to the influence of ritual and rhythm brought by African slaves. Through this African influence came the evolution and significance of Afro-Cuban genres such as Rumba, Danzón, Charanga, and the iconic Son. From the vibrant beats of Rumba to the sophisticated melodies of Son, Cuban music embodies a rich tapestry of cultural fusion. The post-revolution era witnessed shifts in how music is created and shared, yet the essence of Son persevered, evolving with contemporary influences to create new genres. Groups like Sierra Maestra emerged as guardians of tradition, infusing new vitality into the timeless sound of Son. Through their albums "Son: Soul of a Nation" and "Rumbero Soy," Sierra Maestra continues to innovate, ensuring that the soulful rhythm of "Son" remains an enduring symbol of Cuban musical identity. Cuba today is a global music force and has transformed other nations' music along with their own.

Neuromuscular Activity as a Function of the Performer's Focus

Arrianna May

*Research Advisor: Dr. Edward Robinson;
Natural and Mathematical Sciences*

Where a performer places their focus of attention plays an important role in physical activity. Choosing to focus on the body—an internal point of focus—versus—an object or other individual—external focus—affects an individual's movements in their environment. Although attention is crucial to athletic performance, past studies have not seen effective results when telling subjects to focus on a certain part of their body during an exercise. The purpose of this study was to use Electromyography (EMG) to determine whether the differences between external and internal foci would be manifested at the neuromuscular level. This study was performed with 11 females from Meredith College over the course of 2 visits. Visit one consisted of each participant performing three 5-s maximal effort isometric contractions of biceps. Visit two consisted of each participant completing 4 sets of 10 repetitions using a

bicep curl bar at 50% of their max force. Two of those sets focused on the internal focus—the muscle performing the exercise—and two sets focused on the external focus—the barbell. Paired t-tests revealed a statistically significant difference for mean power frequency ($p=0.021$) and higher percentage of electrical signal conducted ($p=0.011$). The results of the current experiment differed from current research—a study performed in males found performance was more effective and efficient with external focus. According to the results of our study, using an internal focus will result in better performance for females completing bicep curls.

Utilizing City Bird to Calculate Species Vulnerability Indices for Triangle Area College Campuses

Abigail McPherson

*Research Advisor: Dr. Megan Serr;
Natural and Mathematical Sciences*

Window collisions are a leading cause of fatality for birds. City Bird is a community science project that monitors bird-window collisions on three college campuses in the Triangle Area. The aim of this research project was to confirm if there is a correlation between relative abundance and collision risk during the fall migration season. On Meredith's campus, I recruited students to survey the Science and Math Building, Carlyle Campbell Library, and the Cate Student Center by monitoring daily for collisions. To analyze the data, I utilized eBird's database to obtain the mean abundance raster for the post-breeding season. I then overlaid the raster file for each campus's perimeter. From the relative abundance, I correlated the risk with abundance. I then ranked the top five highest-risk scores for each campus. The Common Yellow-throat *Geothlypis trichas* had the highest risk score. However, the American Robin *Turdus migratorius* had the highest average abundance but did not have the highest number of collisions. This data indicates that there is not a significant correlation between species relative abundance and their risk score. In other words, just because a species is in higher abundance

does not indicate it is more vulnerable to collisions. This highlights the need to protect birds from window collisions in general and not just during the migration season. With this data, I advocate for Meredith to install anti-bird strike window film on its buildings, starting with the Science and Math Building, which had the highest number of bird strikes on campus.

Discerning and Living the Label: A Comparative Study of Sexual Identity Recognition and Expression in Heterosexually- and Non-Heterosexually-Identified Individuals

Georgia Meade

*Research Advisor: Dr. Amie Hess;
Social and Behavioral Sciences*

In the years since the American Gay Rights Movement began in the early 1900s, individuals that identify as sexual minorities have gained a degree of mainstream acceptance in American society. For example, according to a recent poll from PEW Research, about 61% of Americans hold positive views of same-sex marriage (Borelli 2022). Despite this, LGBTQIA+ individuals continue to face difficulties recognizing their sexuality and feeling comfortable expressing their sexual identity. Research in this field indicates the presence of a sexual hierarchy in American society that values and rewards heterosexuality above other identities (Rubin 1984; Marchia and Sommer 2017). In this study, I analyze the influence of sexual identity and race on the age at which individuals first identify and first feel comfortable expressing their sexuality. The project uses data from 16 in-depth interviews with a mix of LGBTQIA+ and straight individuals between the ages of 18-52. The sample includes seven White and nine non-White respondents. I find that sexual identity and race have notable impacts on the age at which individuals recognize and express their sexuality with an average recognition age of 4.928 years for heterosexual individuals and 11.833 years for non-heterosexual individuals, respectively. The mean age difference is even greater when looking at the non-White sample.

This research contributes to a body of work that increases understanding of cultural differences and barriers for White and non-White queer individuals.

Toxic Masculinity in *The Great Gatsby*

Kelsie Nesselrode

*Research Advisor: Dr. Kelly Roberts;
Arts and Humanities*

This project discusses toxic masculinity in Fitzgerald's classic novel *The Great Gatsby*. The project offers insights by literary critics that a 21st century understanding of how toxic masculinity is portrayed in the novel. Focusing on reading *Gatsby* through a feminist perspective allows readers to delve into the interwoven ideals of the 1920s. Through the exploration of the male characters such as Jay Gatsby and Tom Buchanan, a feminist approach unveils the looming influence of patriarchy and allows us to reevaluate the novel's central themes. We hope this analysis also allows an analysis of deeper societal issues that fuel characterization and dispositions embedded in the novel.

Exploring How Comfortable Undergraduate Students at Meredith College are Sharing Their Mental Health Concerns with Faculty and Staff

Brynn Oliver, Erica Buchheim, and Ellie Osborne

*Research Advisor: Dr. Mark O'Dekirk;
Social and Behavioral Sciences*

Students and faculty/staff often establish strong working relationships. Students should feel comfortable reaching out to faculty and staff for mental health help, especially as it relates to classes and academics (Pople, 2013). However, it is unknown whether students actually feel comfortable reaching out about these issues. That is what this research study explored. We examined students' (N = 157) comfort with their faculty/staff at Meredith College, as well as whether they felt they had been properly trained on mental health subjects. We also inquired whether students

had reached out to staff/faculty for help, and if they received mental health support from another source such as the chaplain's office or counseling center. It was hypothesized that students would not feel comfortable reaching out to faculty and staff regarding mental health. Participants completed a 26-item survey that asked questions related to their mental health and their relationships with faculty and staff on campus. Contradictory to the hypothesis, the correlations suggest that participants do feel supported by faculty and staff at Meredith College ($p < 0.001$). These results were statistically significant. Implications that are discussed will be ways to help improve faculty/staff's mental health training and build stronger student-faculty/staff relationships.

The Synthesis of Oleanolic Acid and its Derivatives in Yeast Cell Cycles

Katie Juarez Olvera, Jakelin Santos Reyes, and Vanessa Jaimes Bustos

Research Advisors: Dr. Walda Powell and Dr. Karthik Aghoram; Natural and Mathematical Sciences

The project will focus on the synthesis of derivatives of Oleanolic acid and investigate their effect on yeast cell proliferation as a model for anti-cancer drugs. Anticancer drugs are often identified by their ability to alter or slow down cell proliferation. The natural product Oleanolic acid, isolated from plants of the Oleaceae family such as olive plants [1,2]. Oleanolic acid and its derivatives have shown pharmacological activities such as antioxidant, anti-tumor, anti-inflammatory, anti-diabetic, and antimicrobial effects [3-6]. Dr. Aghoram has interest in studying Oleanolic acid with yeast cells but has experienced problems since this large pentacyclic triterpenoid is only soluble in dimethyl sulfoxide (DMSO) which may interfere with yeast cell culture.

Investigating the Connection between Perception and Cognitive Flexibility in Students at Risk for Anorexia Nervosa

Elisabeth Orlandini

Research Advisor: Dr. Mark O'Dekirk; Social and Behavioral Sciences

Because one's body image is formed by the combination of different sensory inputs, this perception will be distorted if there are alterations in one's multisensory integration (Gaudio et al., 2014). Multiple studies have shown that individuals with Anorexia Nervosa (AN) have a different multisensory integration than healthy controls; thus, it is suggested that the body image distortion in individuals with AN could be caused by this altered sensory integration (Teaford et al. 2021). Additionally, it has been shown that AN patients have diminished cognitive flexibility. Therefore, if an individual with AN has an altered perception of themselves and truly perceives their body different from reality, yet simultaneously cannot change their beliefs because of their weak cognitive flexibility, it seems logical that Anorexia Nervosa is so difficult to cure. The present study explored if individuals at risk for developing AN experienced alterations in their sensory perception and/or cognitive flexibility compared to individuals not at risk for developing an eating disorder. Participants (N = 16), consisting a group at risk for AN and a group of healthy controls completed two experimental tasks. Sensory perception was measured through the rubber hand illusion (RHI) and cognitive flexibility was assessed by the haptic task (HT). Wilcoxon Rank Sum tests and Pearson correlation tests were conducted and found that the risk group had a significantly stronger illusory effect of the rubber hand present, $p < .05$. Differences between groups in cognitive flexibility were present, yet not statistically significant, possibly due to small sample size.

Revitalizing Student Housing: A Case Study of Redesigning Student Housing and Lounge Spaces at Meredith College

Claire Parker

*Research Advisor: Dr. Julie Watkins;
Social and Behavioral Sciences*

Approximately eighteen million American students are enrolled in US colleges. Residence halls, on-campus apartments, and off-campus housing options should promote personal, social, and academic growth. This study investigates the transformative process of redesigning student housing and lounge spaces at Meredith College and in Raleigh, aiming to create environments that foster holistic student well-being, social interaction, and academic success. Through an approach involving student feedback and prior research, a comprehensive redesign was formulated using digital media software. The redesigned spaces focus on integrating architectural innovations, ergonomic furnishings, and technological advancements tailored to meet contemporary students' evolving needs and preferences. Key factors considered in the redesign process include functionality, aesthetics, comfort, accessibility, and technology integration. Traditional dormitories are reimaged to offer enhanced privacy, communal areas for socialization, and study spaces conducive to academic pursuits. On-campus apartments are evaluated for their suitability as study environments, examining factors such as noise levels, furniture arrangements, and amenities. Additionally, off-campus apartment options are explored to provide insights into students' living arrangements beyond the campus borders.

Investigating Milk's Protective Influence on Probiotic Bacteria in Low pH Environment

Honeysa Patel

*Research Advisor: Dr. Jason Andrus;
Natural and Mathematical Sciences*

The probiotics industry has witnessed substantial growth in recent decades and is poised for further expansion. Widely prescribed

for various conditions such as antibiotic-associated diarrhea and urinary tract infections, the efficacy of probiotics raises critical questions due to disparate and conflicting data supporting their role in different conditions. A pivotal factor influencing probiotics is the highly acidic pH of the stomach, ranging from 1.5 to 2.0, whereas probiotics thrive in a pH range of 5.5 to 6.2. Previous studies in this lab demonstrated the negative effects of low pH on probiotic supplement viability. The current work investigates the protective role of nonfat dried milk against a low pH environment mimicking the stomach's harsh conditions. The study involves exposing probiotic bacteria, *Lactobacillus rhamnosus* GG, to this solution with and without the milk powder. Subsequently, the collected data, counted colony-forming units (CFUs) at various time intervals and plated at different ratios, is analyzed. The outcomes aim to deepen the understanding of probiotic behavior in the human gastrointestinal system, especially when consumed with dairy products. This knowledge can have profound implications for the development of probiotics and the formulation of products with improved delivery systems, ultimately enhancing their efficacy and health benefits in humans.

Potential Effects of Influx of Cooling Tower Water on Meredith College Lake Organisms: Examining Survivability of Water Flea, *Daphnia magna*

Noelle Pearce

*Research Advisor: Dr. Maria Pickering;
Natural and Mathematical Sciences*

Meredith College uses approximately 6 million gallons of water in the campus cooling system, with about 1 million gallons left over after evaporation. When the water reaches a conductivity of 1200 microsiemens/centimeter, a valve is opened that lets water flow down the drain to the City of Raleigh for treatment (P. Korest, personal communication, March 28, 2023). There is a plan on campus to redirect this water to Meredith Lake as a more cost effective and environmentally sustainable

solution. This study aims to understand how the influx of this cooling tower water might affect the organisms in Meredith Lake by exposing the freshwater crustacean *Daphnia magna* to different test solutions of lake and cooling tower water and monitoring them for survivability. Water chemistry testing was also performed to determine the concentration of different compounds present; cooling tower water had the highest levels of all compounds tested. After running the experiment for 168 hours, 100% lake water had the highest survivability of *D. magna* and 100% cooling tower water had the lowest, showing a 33% decline in survivability relative to lake water. There was no significant difference between the survivability of a 50:50 lake:tower solution and a control of spring water. Based on the results of this experiment, it is possible that the addition of cooling tower water may have negative effects on macroinvertebrate life cycle stages, and careful monitoring will be needed to ensure the health and stability of the Meredith Lake ecosystem.

Image Processing Development of Coated Aluminum Corrosion

Kendall Putnam

*Research Advisor: Dr. Peter Fedkiw;
Natural and Mathematical Sciences*

Performance coatings on metal surfaces are susceptible to filiform corrosion from ion exposure through macroscopic defects of the coating. The filiform propagation and movement that occurs beneath the coating surface can be monitored by taking stereomicroscope images at various time intervals during the experimental process. The understanding of how the filiform activity changes over time and under different conditions is improved through analysis of captured images to obtain filiform area (cm²) and growth trends. The main objective of the research is to establish a method to extract filiform corrosion area on coated aluminum sheets and improve means of data collection for such experiments. Digital image analysis is used to remove excess background noise and other impediments. Panels were cut, scribed,

and initiated in acidic conditions prior to taking images at established time intervals to observe filiform characteristics. It was determined that the most accurate method of image analysis was to perform a pseudo Flatfield correction factor upon visual captures and manually select the combined scribe and filiform area. A MATLAB code was also developed to stitch multiple images prior to carrying out a pseudo Flatfield correction factor to accurately record the total filiform area. This project is ongoing with new methods of extracting filiform corrosion areas being developed and carried out in the laboratory.

Pride of Puerto Rican Music

Roxanna Rodriguez

*Research Advisor: Dr. DeMar Neal;
Arts and Humanities*

Puerto Rican music is deeply rooted in a rich cultural heritage that reflects the island's history, traditions, and identity. From the lively rhythms of salsa and the passionate melodies of jibara to the upbeat sounds of plena, Puerto Rican music embodies a sense of pride and resilience that is intrinsic to the island's people. Puerto Rican music has many cultural influences including African, Spanish and Taino traditions and rhythms. This fusion of musical styles and rhythms serves as a testament to the island's history and the resilience of its people. Through music, Puerto Ricans express pride in their heritage, using traditional instruments like the cuatro and guiro to evoke a sense of nostalgia and belonging. Lyrics often celebrate the beauty of the island, its people, and the struggles they have overcome. Puerto Rican music stands as a powerful symbol of cultural pride, resilience, and celebration, embodying the heart and soul of the island and its people.

Thematic Analysis: West Virginia v. Environmental Protection Agency and Subsequent Climate Policy

Ashton-Brette Rusthoven

*Research Advisor: Dr. David McLennan;
Arts and Humanities*

In *West Virginia v. Environmental Protection Agency* (2022), the US Supreme Court used the major questions doctrine to hold that the Environmental Protection Agency (EPA) was acting beyond its jurisdiction when it created the Clean Power Plan (2015) because the EPA did not receive clear congressional approval. By using a thematic analysis, I investigated the frequency of themes from *West Virginia v. EPA in the Inflation Reduction Act* (2022) and the EPA's newest proposal for greenhouse gas emission regulation (2023). Due to the presence and frequency of the themes in the documents that I analyzed, I was able to support my hypothesis that the themes prevalent in *West Virginia v. EPA* will also be prevalent in the later greenhouse gas emission reduction policies. This indicates that the Supreme Court has had an influence on Congress and the EPA when creating the *Inflation Reduction Act* and EPA's Proposed Rule. By observing the presence of themes in these documents, my study can contextualize the relationship between the Supreme Court, Congress, and the EPA, in regards to greenhouse gas emissions reduction policy and the major questions doctrine.

Exploring Characteristics of Successful TikTok Influencer Partnerships in Audience Engagement: A Comparison of Two Prebiotic Sodas

Jenna Schroeder

*Research Advisor: Dr. Teresa Holder;
Social and Behavioral Sciences*

As the marketing industry shifts from traditional marketing toward the use of influencer marketing, it is important to understand what specific factors make these influencer partnerships successful. This study investigated the variables influencing the success of

influencer partnerships on TikTok. Two prebiotic sodas with strong social media presence, Olipop and Poppi, were compared for analysis using sample Influencer videos and scripts for content analysis. The analysis focused on three variables: level of audience reach, engagement measures, and persuasive tactics. This study offers insights for marketers, influencers, and platform operators seeking to optimize TikTok influencer strategies.

Rembétika in Greece

Norah Shannon

*Research Advisor: Dr. DeMar Neal;
Arts and Humanities*

This presentation explores Greece's musical diversity, with a spotlight on Rembétika, often dubbed the "Blues of Greece." Charting the historical shifts shaping Greece's musical landscape, it delves into Rembétika's evolution and its lasting imprint on Greek culture. Examining contemporary expressions of Rembétika, attendees will grasp its unique essence and sound. By the presentation's end, participants will emerge with a heightened appreciation for Rembétika's profound influence on Greek music and society.

Fear of Crime and Perceptions of Risk on College Campuses

Sara Shuller

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Social and Behavioral Sciences*

The level of college students' fear of crime can depend on many factors, including their gender, race and ethnicity, or whether they live on or off-campus (e.g., Hayes et al., 2018; Lee & Hilinski-Rosick, 2012). In particular, females have higher odds of feeling unsafe on campus compared to males (Daigle et al., 2022). The present study aims to look at differences in students' fear of crime and perception of risk between those attending Meredith College (a women's institution) and North Carolina State University (a co-ed institution). Participants were recruited using an online survey via snowball and

convenience sampling among Meredith College and North Carolina State University students through professors, students, or campus organizations. Data collection is ongoing (current N=55). Participants self-reported their fear of crime and perceived risk of sexual assault on a series of likert scales. In addition, demographic questions were asked to gain a better understanding of the participants (e.g., gender, race), and to determine what college they attend. A series of inferential statistics will be conducted to determine if there is a difference in fear of crime and perceived risk of sexual assault, between students attending a women's college and a co-ed institution. Findings may be limited in generalizability based on the small sample within two institutions in the same city. Further research could improve the generalizability of findings to the greater population.

Elevating Work; Vermeer's Lacemaker

Rachel Smith

*Research Advisor: Dr. Beth Mulvaney;
Arts and Humanities*

Vermeer's *The Lacemaker* presents a woman bent over a lace making table. Her focused gaze remains on the bobbins positioned mid-action in her hands. An unseen light source, presumably a window, highlights the figures forehead, fingers, and work atop the table. To the woman's immediate left sits a book held closed by two dark ribbons, perhaps patterns for lace or a prayer book. To her right is a tangle of blurry red, white, and blue thread falling out of a large blue sewing cushion. This intricate scene measures only 9 $\frac{7}{8}$ inches by 8 $\frac{1}{4}$ inches.

Johannes Vermeer, a Dutch painter from Delft, rejected the typical Baroque practice of grandeur and exuberance and instead painted gentle and often mysterious scenes from the domestic realm inhabited almost exclusively by women engaged in pastimes or household chores. My research focuses on why Vermeer chose to depict women engaged in mundane domestic tasks as the subject of his highly celebrated Dutch paintings from

the seventeenth century. The women in his paintings do not acknowledge anyone's presence as they gaze into space or intently concentrate on their task at hand, avoiding all means of engagement. This world of female domestic activity has been traditionally closed to viewers, but Vermeer constructed his art in this tension between vulnerability and restraint, raising women's work to a moment worthy of artistic expression. Despite needlework being a mundane task, *The Lacemaker* makes the intensity of a woman's undivided interest and attention deserving of high art in less than 10 inches of height. Needlework, although not traditionally regarded as high art, is elevated by Vermeer to the level of high artistry requiring singular focus and intensive intellectual engagement.

Investigating Bd and Bsal in Raleigh, North Carolina Amphibian Populations

Kara Solomon

*Research Advisor: Dr. Megan Serr;
Natural and Mathematical Sciences*

Amphibian fungal pathogens *Batrachochytrium dendrobatidis* (Bd) and *Batrachochytrium salamandrivorans* (Bsal) are negatively impacting amphibian populations worldwide and here in North Carolina. Bsal has decimated salamander populations in Western Europe, but has not yet been detected in North America. At the same time, Bd has led to population declines for both frogs and toads around the world and here in North Carolina. Our research contributes to local Bsal and Bd detection efforts. For this study, we had two field sites in Wake County: Swift Creek Bluffs and Blue Jay Point County Park. At each location, we dermally swabbed individual amphibians for Bd and Bsal. We also recorded biometric data (weight, snout-to-vent-length, etc.) as well as the location where each individual was captured. Bd and Bsal samples were shipped to the USGS National Wildlife Health Center for processing by the SNAPS (Student Network for Amphibian Pathogen Surveillance) program. There, the swabs were analyzed using qPCR to determine

whether or not they were infected with Bd and/or Bsal. Surveying for Bd and Bsal in Wake County amphibian populations is an important first step to understanding the overall health of local amphibians.

Americans in Rome: Edmonia Lewis and Harriet Hosmer

Sara-Rose Spann

*Research Advisor: Dr. Beth Mulvaney;
Arts and Humanities*

Edmonia Lewis and Harriet Hosmer were trailblazing American sculptors who gained prominence in Rome, Italy, during the nineteenth century; despite their shared dedication to the neoclassical style, their backgrounds and artistic approaches diverged significantly. Lewis, a woman of African American and Native American descent, infused her sculptures with heritage elements, celebrating marginalized identities and challenging prevailing norms. In contrast, Hosmer's sculptures were often rooted in classical themes and historical narratives, with less overt ties to personal or cultural identity.

The critical reception of their works also reflected societal attitudes of the time. Both faced accusations of taking credit for work produced by male counterparts or apprentices, a challenge exacerbated by prevailing gender biases. While such allegations were commonplace among their male contemporaries, Lewis and Hosmer faced heightened scrutiny due to their gender and minority status. Despite these obstacles, they persevered, navigating complex intersections of race, gender, and identity to carve out successful careers in a male-dominated field.

We can gain insight into these women's distinct artistic visions and personal journeys through a comparative analysis of specific works such as Hosmer's *Zenobia in Chains* and *Puck*, Lewis's *Poor Cupid*, and *The Death of Cleopatra*. Their ability to challenge conventions, confront adversity, and pave the way for future generations of women sculptors underscores their enduring legacy in the chronicle of Art History. In examining

their lives, works and primary documents, I will demonstrate each of these sculptors' paths to success. I will contextualize how Hosmer challenged traditional gender norms and social expectations and how Lewis included African and Native American heritage in her sculptures without risking financial or personal success.

Stuck in the Mirror: Does a Mirror in Learning Choreography Affect the Mental Health of Dancers?

Savannah Stainback

*Research Advisor: Dr. Carol Finley;
Behavioral Sciences*

This study aims to see if there is a difference in dancers' logged mental health after learning a Jazz, Ballet, and Modern/Contemporary dance 32-count phrase in a space with a mirror versus their logged mental health after taking a Jazz, Ballet, and Modern/Contemporary dance 32-count phrase in a space without a mirror. Mirrors are constantly used in Western dance technique classes to establish and give feedback about body alignment, timing, and movement qualities. However, mirrors are just as often a hindrance to dancers' self-esteem as they develop an unhealthy view of their bodies and abilities. In this study, college-trained modern dancers from Meredith College's Meredith Dance Theatre will be given a questionnaire about their current mental health state after learning a Jazz, Ballet, and Modern/Contemporary 32-count phrase in a dance studio with a mirror in front and to their side. Dancers will then learn a different phrase in each style in a dance studio without mirrors and will take the same questionnaire. The dancers involved in the phrase learning will follow Meredith College Dance's typical dress code. Data about the differences between the questionnaires and the participant's feedback will then be collected. Data will then be examined and disseminated.

Synthesis of Fluorescein and its Derivatives

Grace Stutz

*Research Advisor: Dr. Alexandra Ormond;
Natural and Mathematical Sciences*

Fluorescein is a well-known dye used in ophthalmology to detect eye problems including tears of the sclera and iris. Certain derivatives of fluorescein have been proven to have antimicrobial properties, which can potentially be used as antibiotics. This study was focused on the synthesis of fluorescein and fluorescein derivatives, with emphasis on analysis and comparison of optical properties and purity through use of H-NMR, UV-VIS, and FTIR. The derivatives were prepared using hydrazine monohydrate, methanol, ethanol, isopropanol, ethylene diamine, and acetic anhydride as reagents, respectively. The presentation will focus on results of synthesis and analysis of fluorescein and its analogs.

From Dionysus to Drag Race: A History of Genderqueer Expression in Theatre

Sky Symonds

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Arts and Humanities*

From its very origins, theatre is laden with artists who use their craft to blur the gender binary and invent new and unique ways of creative expression. In ancient Greece and Rome, all female characters were played by men who altered their appearance in order to truthfully deliver that lived experience of a person of a different gender. The same can be said for Elizabethan England, in which every production of Romeo and Juliet had a young man pleading, "wherefore art thou Romeo?" In Japanese kabuki theatres, the art of crossdressing was approached with a great amount of care and attention to detail in order to allow for an intense expression of emotion. In Baroque opera, young actresses who played pants roles (meaning they were portraying males) were seen as incredible talents and vital parts of their shows. Even now, popular musicals such as RENT, Kinky Boots, La Cage Aux Folles, and

many others use subversive gender expression and, in many cases, flat out drag as tools to help communicate a story and connect with audience members. History alone can prove that a strict gender binary has no place in the theatre. That being said, in the wake of the current social displeasure toward gender nonconforming behavior and the drag bans that are being passed in several states, theatre as a whole may be in danger. Now is the time to fight for the end of policing gender queer expression, or the art will suffer as a result.

Forecasting Energy Stock Prices Utilizing Historical Data and Time Series Analysis

Jessica Tan

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U.S. households are primarily powered by fossil fuels, which include coal, crude oil, and natural gas. Before residents pay their energy bills, utility companies must produce or buy kilowatt-hours (KWhs) to supply the energy grid, hence price prediction is important for forecasting consumption and energy production plans. Historical stock prices are a source of freely available time series data that could be used for this purpose. The Seasonal AutoRegressive Integrated Moving Average Model (SARIMA) is a class of statistical models used for forecasting time series data that is widely used due to its power and flexibility. In this thesis, we conduct a time series analysis of available historical stock price data for coal, crude oil, and natural gas in an attempt to forecast future stock prices. Using R programming, we fit SARIMA models using separate manual and automated processes. Then, we evaluate the models through cross-validation and comparison to a simpler exponential smoothing approach. We find that, despite the popular use of SARIMA modeling in time series analysis, it is limited in its ability to capture the behavior of stock price data. This suggests that to accurately forecast energy stock prices in the United States, it may be more advantageous to use a model average approach rather than using a single model.

Investigation of Tetrahydrocannabinol (THC) Analogues in North Carolina

Clary Taylor and Peyton Vanada

*Research Advisor: Dr. Jessica Thorpe;
Natural and Mathematical Sciences*

Since the passing of the 2018 Farm Bill and the North Carolina Farm Act in 2021, the sale and recreational use of hemp-derived tetrahydrocannabinol (THC) products in North Carolina has skyrocketed. However, the market for these products is not federally regulated and production and quality vary wildly from company to company. Without regulation there is no accountability for actual versus advertised THC content in these increasingly popular commercially available products. Here we show the actual versus advertised cannabidiol (CBD), cannabinol (CBN), $\Delta 8$ THC and $\Delta 9$ THC content of a variety of these products obtained from stores in the Raleigh, NC area. Using a variety of methods, we extracted THC from hemp-based products and, using Gas Chromatography-Mass Spectrometry (GC-MS), identified relevant compounds.

Memorable Melodies: The Intersection of Music and Mnemonics

SarahElla Trustman

*Research Advisor: Chelsea Waddelow;
Arts and Humanities*

As a student and teacher of mnemonics for the past decade, and a musician for over three decades, I am fascinated by the link between music and memory. Throughout history, elders, shamans, and scholars around the globe have traditionally used mnemonics (memory systems) to recall vast amounts of cultural knowledge. Modern psychological researchers are working to unlock these mysteries, although much of this research overlooks the incorporation of musical elements within ancient memory systems. This presentation covers my literature review of the existing research in this important interdisciplinary intersection. We will explore what makes a good musical mnemonic, what mistakes to avoid in creating one, and what best practices

are supported by current research. I will teach and demonstrate a few of my favorite musical mnemonics, and hope to inspire you to incorporate musical mnemonic devices into your teaching and learning. Finally, this presentation introduces my ideas for the future of research in this exciting area.

Soundtracking Concentration: Investigating the Impact of Music on Attention and Distraction

**SarahElla Trustman, Tiffany Millner,
Josephine Mulveny, and Harini Sivaraman**

*Research Advisor: Dr. Candalyn Rade;
Social and Behavioral Sciences*

Whether music aids in concentration or introduces distraction is a topic of great debate, both within and outside the research literature. The aim of this study was to explore the effects of familiar music on distraction and, conversely, attention. Hypotheses predicted that music would reduce attention and increase distraction. Additionally, influence was predicted to vary depending upon the level of familiarity of the music and lyrics. Seventeen undergraduate students participated in a post-test dependent design. Participants completed four similar word searches under four musical conditions (silence, instrumental, foreign language, English). Attention and distraction were measured through word search completion and a self-reported distraction scale. Participants performed significantly better and reported significantly less distraction in the silent condition when compared to all other conditions. Additionally, performance scores were significantly different between all conditions, with the exception of instrumental music compared to music in foreign languages. Notably, self-reported distraction scores did not accurately reflect performance scores. These results add to the growing body of research into the topics of music and concentration. However, music is nearly infinitely varied with numerous dimensions including tempo, time signature, key signature, instrumentation, pitch, and volume. Comparatively, this research was very limited in scope. Replicating this study with

different musical conditions exploring these dimensions would further illuminate the best musical practices to improve attention and aid in cognitive tasks.

Investigation of Tetrahydrocannabinol (THC) Analogues in North Carolina

Erika Vanada

*Research Advisor: Dr. Jessica Thorpe;
Natural and Mathematical Sciences*

Since the passing of the 2018 Farm Bill and the North Carolina Farm Act in 2022, the sale and recreational use of hemp-derived tetrahydrocannabinol (THC) products in North Carolina has skyrocketed. With the increase in sales, the market for these products must continue to pass federal regulation to maintain legality. This becomes an issue when production and quality vary from company to company. Through this project, we are testing how these local commercial products' actual versus advertised THC content compare. Over three semesters we worked to develop a method to analyze these products by Gas Chromatography-Mass Spectrometry (GC-MS) and created a library of cannabidiol (CBD), cannabinol (CBN), $\Delta 8$ THC and $\Delta 9$ THC, Hexahydrocannabinol (HHC) and Cannabigerol (CBG). This method and library allowed us to use our extractions from various products and identify the cannabinoids they contained. A calibration curve was created to quantify how much $\Delta 9$ THC is present. Through testing these products, we have found products that tend to contain unlisted and unadvertised cannabinoids; however, using our calibration curve we have yet to find products above the legal 0.3% $\Delta 9$ THC limit.

From Confines to Freedom: Location as a Reflection of Anne Elliot's Internal World and Emotional Development in Jane Austen's Persuasion

Constance Wesley

*Research Advisor: Dr. Robin Colby;
Arts and Humanities*

Out of all her novels, Jane Austen's *Persuasion*

(1817) is one of her most emotionally mature works. The novel examines the capable yet unappreciated Anne Elliot, who crosses paths with her former fiancé, Captain Frederick Wentworth, eight years after she broke their engagement. Having spent this separation in a state of isolation within her family estate of Kellynch Hall, Anne is further disoriented when her father's financial ineptitude forces the family to relocate. Beginning with this departure from Kellynch, Austen entwines Anne's emotional progression with her surroundings. Anne's journey begins at the neighboring estate of Uppercross, where she is reminded of her value but ultimately retreats into her caregiver role rather than face her internal turmoil. In order to recognize her emotional stagnation and regain her lost agency, Anne must relocate to a space that is entirely new to her. The seaside village of Lyme offers Anne the opportunity to reassess her circumstances and recognize her worth as an individual. Rejuvenated by the sea, Anne becomes a far more active participant in her own narrative, and she transitions to the bustling city of Bath with a newfound sense of self. When she is offered the opportunity to return to Kellynch, Anne instead prioritizes her own happiness and well-being by rekindling her relationship with Wentworth. Through her transition to a life at sea, Anne leaves behind the emotional stagnation that haunted her life at Kellynch and embraces a future in which she finally takes control of her own destiny.

Interactions Between Language Experience and the Development of Language Prototypes

Constance Wesley

*Research Advisor: Dr. Mark O'Dekirk;
Social and Behavioral Sciences*

Within the field of cognitive linguistics, prototype theory has been utilized to examine the acquisition of grammatical concepts (Vallerossa, 2021) and the conceptualization of language on the basis of prior experience (Ibbotson et al., 2012). The present study aimed to investigate whether the brain

conceptualizes language as a prototypical category based on an individual's previous language experience and their perception of linguistic patterns within a particular language. Utilizing a lexical decision task, English-speaking participants with varying levels of Spanish language experience (N = 26) categorized stimuli as real Spanish words or pseudowords according to their knowledge and perceptions of the Spanish language. I hypothesized that participants with greater Spanish experience would have a higher percentage of correct responses and quicker response times compared to their peers with less Spanish experience. I also hypothesized that participants with a moderate level of Spanish experience would incorrectly categorize pseudowords as real Spanish words at a higher rate compared to participants with little to no Spanish experience and participants who are fluent or nearly fluent Spanish speakers. Data collection is ongoing, but preliminary analysis shows that participants who claim to be bilingual Spanish and English speakers demonstrate an improved ability to discriminate between word and nonword stimuli. Additionally, preliminary observations suggest that people with some Spanish experience are more likely to incorrectly categorize nonwords as real Spanish words.

Japanese Music

Natalie Wiese

*Research Advisor: Dr. DeMar Neal;
Arts and Humanities*

Japanese music has a very distinct sound. This may be due to its ancient musical roots. One of the earliest genres of music in Japan is the Min'yo style of music. Min'yo music sounds different from Western music because it uses foreign instruments. Min'yo instruments include the koto (similar to a harp), shamisen (similar to a banjo), shakuhachi (similar to a recorder), and the taiko (Japanese drum).

Different regions have their own distinctive style of Min'yo music. The Tsugaru region is famous for its instrumental shamisen style. I will play a recording of an instrumental shamisen

style piece and give a brief analysis about what makes it sound different from Western music.

Music is constantly changing. The Okinawa region is famous for being able to update its music with more modern elements while still not losing their Japanese musical identity. Soul Flower Union is a rock band that uses traditional Japanese instruments but combines them with more Western instruments like the keyboard. I will play a short recording of their song "Mungetsu no Yuube" and analyze the song's unique harmonic style.

Through the analysis of Japanese music, I hope to showcase what makes Japanese music sound so different from Western music.

Coiling Catalysts: Tracing the Alchemical Dragon's Visual Traditions

Avery Williams

*Research Advisor: Dr. Shannon Grimes;
Arts and Humanities*

Alchemy, the historical progenitor of chemistry, is a complex and ancient practice consisting of religious and chemical traditions that span various epochs and cultures. Pursuing the secrets of transmutation, Alchemists crafted a sophisticated visual language of symbols to veil their work in mystery and allegory. The scholarship on alchemy's rich visual language has remained understudied, leaving a gap in understanding regarding its intricate symbolism and cultural significance. This essay delves into the visual evolution of a critical alchemical symbol: the dragon. It traces the continuity and changes of the alchemical dragon from its origins in ancient Egyptian mythology through the realm of Greco-Egyptian alchemy. Subsequently, it explores the symbol's evolving contexts influenced by European folklore and the symbolic battlegrounds of Christian dragon-slaying traditions. The essay further examines the widespread use of the alchemical dragon as a physical and mystical symbol during the early modern period in Europe. This research aims to illuminate the symbolic significance and transformative symbolism inherent in the alchemical dragon—an ancient symbol

that encapsulates mythological and religious importance, embodying the essence of alchemical transmutation and spiritual enlightenment that has retained its remarkable consistency from its first use in an alchemical context over nearly two millennia ago.

The Fan Bearers: Exploring Women's Roles as Models and Curators in Japonisme

Avery Williams

Research Advisor: Dr. Beth Mulvaney; Arts and Humanities

The nineteenth-century reopening of Japanese ports to the global market sparked a widespread fascination with Japanese art, artifacts, and commodities across Europe, particularly in France. This surge of interest significantly influenced French impressionist artists, who were introduced to Japanese woodblock prints, known as ukiyo-e or "floating world," and adopted many of its fundamental principles into their art movement. A prominent aspect of the ukiyo-e tradition is the depiction of Bijin-ga, or images of beautiful women, often portrayed as courtesans adorned with intricate hairstyles, striking makeup, and elaborate attire. Consequently, many impressionist paintings center around Bijin-ga subjects, portraying women as passive muses reminiscent of ukiyo-e aesthetics, frequently incorporating traditional Japanese accessories- most prominently, the uchiwa fan.

The portrayal of women in European art with the uchiwa fan is rooted in a historical association of Asian art and artifacts as feminine adornments, despite the uchiwa fan being a gender-neutral object in Japan primarily used for cooling during hot summers. In impressionist paintings, women are often depicted holding or surrounded by uchiwa fans, serving primarily as models. However, recent scholarship has highlighted the crucial role of women in introducing European audiences to Asian artifacts through their involvement in the importation, collection, and distribution of artworks and artifacts. This

research aims to underscore the symbolism of the uchiwa fan as a feminine motif in impressionist paintings and to juxtapose the representation of passive female models in these artworks with women's active roles in introducing such objects to France.

Effects of Neighborhood-level Factors on Cardiovascular Disease Outcomes in North Carolina

Nyazjha Wilmer

Research Advisor: Dr. Carolina Perez-Heydrich; Natural and Mathematical Sciences

The motivation for this project was to observe if food availability and greenspaces had an effect on cardiovascular mortality rates, and determine the role of other neighborhood factors on the cardiovascular mortality rate. To answer this, we used R software to conduct simple regression and correlation tests to analyze the data, and QGIS software to display the results. Results indicated that access to medical care as well as greenspaces within a county were associated with reduced rates of cardiovascular disease deaths. Crime and food environments had no effect, while higher levels of poverty in a county were associated with higher rates of cardiovascular mortality. These results are similar to what other researchers have found in previous investigations.

Antimicrobial Resistance in Bacteria Isolated from Meat Products

Jada Zaragoza and Rothmila Tajrian

Research Advisor: Dr. Susan Gardner; Natural and Mathematical Sciences

This research investigates the presence of antimicrobial resistance in bacteria isolated from meat products, with a primary focus on meat from cows, specifically ground beef. Utilizing a serial dilution approach, we aim to analyze and characterize bacterial isolates to discern patterns of resistance against various antimicrobial agents. This study seeks to contribute valuable insights into the prevalence and nature of

antimicrobial resistance in bacteria associated with domesticated cows, offering critical information for public health and food safety considerations. The methodology involves a comprehensive examination of ground beef samples through serial dilution techniques, with subsequent biochemical characterization of bacterial isolates to evaluate their susceptibility to a range of antimicrobials. The findings aim to enhance our understanding of antimicrobial resistance dynamics in meat products and provide a basis for informed strategies in mitigating potential risks associated with the consumption of such products.

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