MOREHEAD STATE UNIVERSITY™
CENTER FOR CAREER DEVELOPMENT AND EXPERIENTIAL EDUCATION
CAREER SERVICES | EDUCATION ABROAD | INTERNSHIPS | RESEARCH | SERVICE LEARNING

Annual Report of Undergraduate Research Fellows

August 2023 – May 2024

Morehead State University

Compiled by: Alexis Mathews, Coordinator of Undergraduate Research

***Information displayed directly as provided through faculty progress reports.**

Table of Contents

Caudill College of Arts, Humanities and Social Sciences

Department of Communication, Media, Art & Design

Adams, Olivia

Major: BFA Art
Faculty Mentor: Joel Knueven, Jacob Lee, Elizabeth Mesa-Gaido
Research/Project Title: Analog Printing for Design
Project Abstract/Summary: We are learning about analog printing for design and assisting the Art & Design program to get stations/labs organized and usable for letterpress printing and screen press printing. We are using both of these media/technologies to create handmade designs. Objectives: increased understanding of historical design processes; gained technical knowledge in working with letterpress type and screen printing; combined type and image(s) to create designs; worked on organizing letterpress type; assisted in setting up screen print lab and multiple stations (chemical, spray, exposing, and printing); created step-by-step video instructions; and utilized letterpress printing and screen press printing. Results: gained technical knowledge in working with letterpress type and screen printing; co-designed and printed limited edition, hand screen pressed posters combining images and letterpress type for the Kentucky Folk Art Center's Minnie Adkins birthday celebration, which were sold as a fundraising initiative; guided and monitored screen printing for 300+ high school students who attended the Art & Design Program's Annual High School Art Day recruitment event on March 6; and used completed work as part of a BFA application
Project Dissemination:
Adams, Olive. "Analog Printing for Design," poster presentation, Celebration of Student Scholarship, Morehead, KY, April 2024
Exhibition:
2024 Spring Showcase, Juried, April 1– May 4, 2024, Opening Reception: Wednesday, May 1, 4-6 pm
Awards and/or Honors: Accepted into the competitive BFA in Art program at MSU
Post-Graduation Plans (Seniors Only): N/A

Brown, Alexis K.

Major: Studio Art
Faculty Mentor: Joy Gritton
Research/Project Title: Creating Public Awareness of Kentucky Folk Art Center Resources in Eastern Kentucky
Project Abstract/Summary: The Eastern Kentucky Arts Project (EKAP) aspires to offer awareness of Appalachian arts by providing regional residents, including educators, with information about the rich history and cultural resources of the area. This project will be a collaboration between EKAP and the Kentucky Folk Art Center (KFAC) that will allow for promotion of the rich resources the KFAC provides to the region. The UGR fellow will work with KFAC art and library collections (exhibition, installation/promotion and library organization/cataloging) and will prepare features on these resources that can be distributed on the website and social media of KFAC and EKAP. If time permits she will also prepare promotions for the KFAC gift shop that can be highlighted in a similar manner. In this way she will increase awareness of KFAC resources within the region and will also acquire knowledge and skills relevant to contemporary non-profit art organizations.
Project Dissemination: Lonnie and Twyla Money, 50 Years of Kentucky Appalachian Folk Art, February 6th-May 6th, 2024, Kentucky Folk Art Center
Nature and People, November 14th, 2023- January 8th, 2024, Kentucky Folk Art Center
Stories Untold: Secrets Revealed, August 1st, 2023- October 20th, 2023
Awards and/or Honors: First place in the printmaking/drawing category at the 24th Annual Student Art and Design Exhibition
Post-Graduation Plans (Seniors Only): Currently pursuing job positions related to museum and gallery work and plan to apply to graduate schools for curatorial programs for the spring 2025 term

Craig, Bridgett

Major: Strategic Communication
Faculty Mentor: Donell Murray
Research/Project Title: The Advantages of Having a Communication/Public Relations Background in the World of Real Estate
Project Abstract/Summary: Having a communication background from a university is crucial in becoming a realtor. In the real estate sector, it is important to improve interpersonal skills, communicate effectively, build relationships with clients, negotiate deals more effectively, and market properties more efficiently. Communication and public relations are at the core of the real estate world. This market is more than property transactions, it is a people business as well. For real estate agents who want to stand out and thrive in their field, embracing public relations as a strategic component may generate considerable rewards.
Project Dissemination: Presentation:
Craig, Bridgett and Murray, Donell (2024, April). The advantages of having a communication/public relations background in the world of real estate, oral presentation, Celebration of Student Scholarship, Morehead, KY, April, 2024.
Awards and/or Honors: N/A
Post-Graduation Plans (Seniors Only): Bridgett is planning on becoming a realtor.

Douglas, Grace
Major: Art Education
Faculty Mentor: Quinn Maher
Research/Project Title: Ceramic Studio Technician for Art Education Majors
Project Abstract/Summary: This position will further instruct and prepare a candidate to successfully navigate the equipment and processes in a ceramics studio. The procedures and training will include, programing and firing kilns, making/ recycling clay, mixing and understanding glazes from raw materials, and basic studio procedures and tasks. The project will provide valuable preparation and training to students that are interested in teaching ceramics and better prepare them to begin their career.
Project Dissemination: From the Mountains of Appalachia. Gateway Regional Art Center, Mt. Sterling KY. 2023.
University Open, Lex Arts. Lexington KY. 2024
Senior Showcase, Golding Yang Gallery, Morehead KY. 2024
BFA Exhibition, Golding Yang Gallery, Morehead KY.2024.
Awards and/or Honors: Awarded the "Outstanding Senior" for Art and Design Exhibitions:
Honorable Mention (x3)- From the Mountains of Appalachia. Gateway Regional Art Center, Mt. Sterling KY. 2023.
Honorable Mention – University Open, Lex Arts. Lexington KY. 2024
Post-Graduation Plans (Seniors Only): Pursue graduate degree

Duncan, Abigail G.
Major: Studio Art
Faculty Mentor: Robert Bowen
Research/Project Title: Golding-Yang Assistant Fellow
Project Abstract/Summary: The Golding-Yang Assistant Fellow will allow Duncan to learning about how to receive, ship, prepare, install, and exhibit artwork of all forms. They will be trained in how to safely handle artwork, including its installation, to ensure its safety for duration of an exhibit. Duncan will also learn how receptions, visiting artists and other art-related events/programming work, including documenting and promoting the exhibitions through posters, social media and other outlets. Being a fellow will provide them with technical skills needed to present work as a professional artist and also to work in a professional gallery setting. Abigail was instrumental in working with Professor Bowen and other students to install and de-install a variety of exhibitions throughout the year.
Project Dissemination: N/A
Awards and/or Honors: N/A

Post-Graduation Plans (Seniors Only): Abigail plans to continue her studio practice and work toward a career as a studio artist after graduation.

Fischer, Emily

Major: Fine Art
Faculty Mentor: Quinn Maher
Research/Project Title: Ceramic Studio Technician
Project Abstract/Summary: This position will further instruct and prepare a candidate to successfully navigate the equipment and processes in a ceramics studio. The procedures and training will include, programing and firing kilns, making/ recycling clay, mixing and understanding glazes from raw materials, and basic studio procedures and tasks.
Project Dissemination: From the Mountains of Appalachia. Gateway Regional Art Center, Mt. Sterling KY. 2023. University Open, Lex Arts. Lexington KY. 2024
Awards and/or Honors: Awarded the "Outstanding Junior" for Art and Design Exhibitions: First Place- From the Mountains of Appalachia. Gateway Regional Art Center, Mt. Sterling KY. 2023. Second Place – University Open, Lex Arts. Lexington KY. 2024
Post-Graduation Plans (Seniors Only): N/A

Hall, Abigail

Major: Art & Design
Faculty Mentor: Karen Taylor
Research/Project Title: Bon Marché; An introduction to French
Project Abstract/Summary: The textbook is faculty-authored and available for free as a PDF for MSU students. Textbook has multiple illustrations but I am limited to royalty-free images that don't always completely reflect the cultural message or exercise content I wish to convey. Abby Claire's illustrations replace the generic clipart in the text. This academic year she completed the illustrations for Chapters 1-6.
Project Dissemination: MSU Celebration of Student scholarship 2023 "Illustrations for Language Learning"
Awards and/or Honors: MSU Celebration of Student scholarship 2023 Outstanding Oral Presentation
Post-Graduation Plans (Seniors Only): To work as a graphic artist with a company in the Cincinnati area

Justice, Chelby

Major: Art
Faculty Mentor: Robyn Moore
Research/Project Title: Photography Practicum: Learning the Basics of Managing a Fine Art Photography Studio
Project Abstract/Summary: The photography practicum provides Art and Design student researchers with the practical experience of managing a fine art photography studio. Students learn how to operate, manage, and maintain industry standard fine art archival inkjet printers as well as a twelve-station analog black and white darkroom and alternative photographic process facilities. This project provides essential expertise and knowledge that students, as lab monitors, both share with other students and incorporate into their own fine art practice and professional activities. Student researchers learn how to mix, store, and dispose of photographic chemistry, provide daily assistance to undergraduate and graduate students, assist with photography-related student exhibitions and workshops, and generate ideas for improvements to the lab. Students also contribute to the ongoing revision of the Photography Lab Manual, which specifies best practices and operating procedures for future photography lab monitors. The practical knowledge gained from this experience is highly valuable to colleges, universities, community colleges, artist co-ops, and professional photography labs that seek to employ individuals to manage and teach both digital and analog photography practices.
Project Dissemination: Chelby co-created and presented a poster presentation for the Celebration of Student Scholarship on Wednesday, April 17, 2024.
Awards and/or Honors: Chelby's work has been included in several juried student exhibitions, including the 2024 MSU Art and Design Spring Showcase and the 2023 Gateway Regional Art Center's Emerging

from the Mountains: From Appalachia to the World-MSU Student Art Exhibition where she was awarded 3rd Place Drawing/ Printmaking for Desiderium-an Ardent Longing
Post-Graduation Plans (Seniors Only): N/A

Leadingham, Jodi K.
Major: Art Education
Faculty Mentor: Robert Bowen
Research/Project Title: Golding-Yang Assistant Fellow
Project Abstract/Summary: The Golding-Yang Assistant Fellow will allow Leadingham to learning about how to receive, ship, prepare, install, and exhibit artwork of all forms. They will be trained in how to safely handle artwork, including its installation, to ensure its safety for duration of an exhibit. Leadingham will also learn how receptions, visiting artists and other art-related events/programming work, including documenting and promoting the exhibitions through posters, social media and other outlets. Being a fellow will provide them with technical skills needed to present work as a professional artist and also to work in a professional gallery setting. Jodi was instrumental in working with professor Bowen and other students in the installation and de-installation of exhibitions in the Golding-Yang Art Gallery.
Project Dissemination: N/A
Awards and/or Honors: N/A
Post-Graduation Plans (Seniors Only): N/A

Mack, Zander
Major: Media Production and Journalism
Faculty Mentor: Ann Andaloro
Research/Project Title: Being Colorful in Appalachia: An Exploration of Race
Project Abstract/Summary: Heather produced a 30 minute documentary that included interviews from international faculty and students of color. She presented the video documentary at the Appalachian Studies Conference in Cullowhee North Carolina on March 9, 2024. She gave a presentation at the Celebration of Student Scholarship.
Project Dissemination: The documentary was presented at the 2024 Appalachian Studies Conference. He gave a presentation at the Celebration of Student Scholarship. The documentary is posted on YouTube.
Student, Zander Mack and Professor, Ann Andaloro(2024) " Being Colorful in Appalachia: An exploration of race," video documentary presentation, The Appalachian Studies Conference, Culowhee, North Carolina, March 2024.
Student, Zander Mack and Professor, Ann Andaloro(2024) " Being Colorful in Appalachia: An exploration of race," video documentary presentation, The Celebration of Student Scholarship, Morehead State University, Morehead, Ky, April, 2024.
Awards and/or Honors: Zander Mack was awarded a Certificate of Merit at the Celebration of Student Scholarship for his presentation.
Post-Graduation Plans (Seniors Only): N/A

Morgan, Abby
Major: Art Education
Faculty Mentor: Quinn Maher
Research/Project Title: Ceramic Studio Technician for art Education Majors
Project Abstract/Summary: This position will further instruct and prepare a candidate to successfully navigate the equipment and processes in a ceramics studio. The procedures and training will include, programing and firing kilns, making/ recycling clay, mixing and understanding glazes from raw materials, and basic studio procedures and tasks. The project will provide valuable preparation and training to students that are interested in teaching ceramics and better prepare them to begin their career.
Project Dissemination: Oral Presentation/Lessons taught to regional elementary schools through Art Education Program
Oral Presentation/Lessons taught to the Ceramics Guild. 10/23, 04/24.
Awards and/or Honors: N/A

Post-Graduation Plans (Seniors Only): N/A

Parks, Heather

Major: Media Production and Journalism
Faculty Mentor: Ann Andaloro
Research/Project Title: Being Colorful in Appalachia: An Exploration of Race
Project Abstract/Summary: Heather produced a 30 minute documentary that included interviews from international faculty and students of color. She presented the video documentary at the Appalachian Studies Conference in Cullowhee North Carolina on March 9, 2024. She gave a presentation at the Celebration of Student Scholarship.
Project Dissemination: The documentary was presented at the Appalachian Studies Conference. She gave a presentation at the Celebration of Student Scholarship. The documentary is posted on YouTube.
Student, Heather Parks and Professor, Ann Andaloro(2024) " Being Colorful in Appalachia: An exploration of race," video documentary presentation, The Appalachian Studies Conference, Culowhee, North Carolina, March 2024.
Student, Heather Parks and Professor, Ann Andaloro(2024) " Being Colorful in Appalachia: An exploration of race," video documentary presentation, The Celebration of Student Scholarship, Morehead State University, Morehead, Ky, April, 2024.
Awards and/or Honors: Heather Parks received a Certificate of Merit for her presentation at the Celebration of Student Scholarship.
Post-Graduation Plans (Seniors Only): N/A

Pollock, Mason

Major: Media Production and Journalism
Faculty Mentor: Robyn Moore
Research/Project Title: Photography Practicum: Learning the Basics of Managing a Fine Art Photography Studio
Project Abstract/Summary: The photography practicum provides Art and Design student researchers with the practical experience of managing a fine art photography studio. Students learn how to operate, manage, and maintain industry standard fine art archival inkjet printers as well as a twelve-station analog black and white darkroom and alternative photographic process facilities. This project provides essential expertise and knowledge that students, as lab monitors, both share with other students and incorporate into their own fine art practice and professional activities. Student researchers learn how to mix, store, and dispose of photographic chemistry, provide daily assistance to undergraduate and graduate students, assist with photography-related student exhibitions and workshops, and generate ideas for improvements to the lab. Students also contribute to the ongoing revision of the Photography Lab Manual, which specifies best practices and operating procedures for future photography lab monitors. The practical knowledge gained from this experience is highly valuable to colleges, universities, community colleges, artist co-ops, and professional photography labs that seek to employ individuals to manage and teach both digital and analog photography practices.
Project Dissemination: Mason co-created and presented a poster presentation for the Celebration of Student Scholarship on Wednesday, April 17, 2024.
Awards and/or Honors: Mason's work was included in the 2024 MSU Art and Design Spring Showcase, which is a juried exhibition.
Post-Graduation Plans (Seniors Only): N/A

Routt, Ashley

Major: Art
Faculty Mentor: Robyn Moore
Research/Project Title: Photography Practicum: Learning the Basics of Managing a Fine Art Photography Studio
Project Abstract/Summary: The photography practicum provides Art and Design student researchers with the practical experience of managing a fine art photography studio. Students learn how to operate, manage,

and maintain industry standard fine art archival inkjet printers as well as a twelve-station analog black and white darkroom and alternative photographic process facilities. This project provides essential expertise and knowledge that students, as lab monitors, both share with other students and incorporate into their own fine art practice and professional activities. Student researchers learn how to mix, store, and dispose of photographic chemistry, provide daily assistance to undergraduate and graduate students, assist with photography-related student exhibitions and workshops, and generate ideas for improvements to the lab. Students also contribute to the ongoing revision of the Photography Lab Manual, which specifies best practices and operating procedures for future photography lab monitors. The practical knowledge gained from this experience is highly valuable to colleges, universities, community colleges, artist co-ops, and professional photography labs that seek to employ individuals to manage and teach both digital and analog photography practices.

Project Dissemination: Ashley co-created and presented a poster presentation for the Celebration of Student Scholarship on Wednesday, April 17, 2024.

Awards and/or Honors: Ashley's work has been included in several juried student exhibitions, including the 2023 Gateway Regional Art Center's Emerging from the Mountains: From Appalachia to the World-MSU Student Art Exhibition where her work Tarnished received First Place in Photography and the 2024 MSU Art and Design Spring Showcase where her work Cathedral in the Sky was awarded Best in Show.

Post-Graduation Plans (Seniors Only): N/A

Vigil, Danielle E.

Major: Media Production and Journalism

Faculty Mentor: Robert Bowen

Research/Project Title: Sculpture Academic Lab Assistant Fellow

Project Abstract/Summary: As the Sculpture Academic Lab Fellow Dani Vigil will be responsible for maintaining the everyday organization and maintenance of the sculpture studio and maintain evening hours to monitor the safety of students working outside class hours. The sculpture studio becomes a mess within minutes needs constant attention to keep clean, organized and safe, learning these skills will be Vigil's primary focus. They will also be responsible for assisting me in creating signage and training aids to effectively teach students to operate the machinery and equipment responsibly and safely.

Project Dissemination: Poster presentation

Vigil, Danielle E and Wehr, Maija Faith (April 2024). Safety And Risk Management In The Sculpture Studio. poster, Celebration of Student Scholarship, Morehead, KY, April, 2024.

Awards and/or Honors: N/A

Post-Graduation Plans (Seniors Only): N/A

Wehr, Maija F.

Major: Fine Arts

Faculty Mentor: Robert Bowen

Research/Project Title: Sculpture Studio Monitor and Technician

Project Abstract/Summary: Maija will be responsible for learning how to effectively run and maintain a sculpture studio. The will include researching the health and safety concerns within the studio, techniques as well as materials used to create sculptural work. She will help prepare signage, update the MSDS binder for the studio and generally learn the ins and outs of what to look for to keep the studio maintained to a safe and healthy level for the students and faculty. This will not only benefit us in our studio but moving forward in her own studio practice. She will also conduct evening hours monitoring the studio so that students can work safely and with supervision. During the course of the semester Maija was instrumental in creating in cleaning, organizing and overall improving the health, safety and organization withing the sculpture studio. This includes helping Professor Bowen build new shelving, build tables and dors for areas, clean, paint and organize the studio as well as help maintain the day-to day cleaning and organizing of the studio. All of this helps improve the studio for all students that work in it.

Project Dissemination: Wehr, Maija Faith and Vigil, Danielle E (April 2024). Safety And Risk Management In The Sculpture Studio. poster, Celebration of Student Scholarship, Morehead, KY, April, 2024.

Awards and/or Honors: N/A
Post-Graduation Plans (Seniors Only): N/A

Department of English and Modern Languages

Bowman, Kaya

Major: English
Faculty Mentor: Annie Adams
Research/Project Title: Defining College Level Reading
Project Abstract/Summary: The goal of this project was to generate a working definition of "college-level reading" that could aid educational praxis in our general education program. In her short stint with me, Kaya completed some background reading, compiled a list of "reading standards" at other institutes of higher education, and started to outline some of the obstacles and challenges of focusing on reading in an era of distracted focus and short attention spans.
Project Dissemination: N/A
Awards and/or Honors: N/A
Post-Graduation Plans (Seniors Only): N/A

Hall, Victoria

Major: English
Faculty Mentor: Mark Graves
Research/Project Title: American (Southern) Women Writing, 1880-1930
Project Abstract/Summary: American women's literature offers a wealth of opportunities to discover the American experience from an often more gendered experience, and the transitional period from 1880-1930 is a particularly fruitful arena for the study of America's regional literature. This project will begin with a broad survey of American women's literature as context for an more narrowed focus on women's fiction from the Southern United States, including Virginian Ellen Glasgow. The proposed outcome is ultimately the preparation of a short manuscript to be submitted for review to the Ellen Glasgow Journal of Southern Women Writers, currently housed at MSU.
The student has narrowed down the study of the author to one author, Ellen Glasgow, and has read the author's major work as well as reviewed the significant criticism of the author.
Project Dissemination: To be determined upon completion of the work. Hoped for outcome is a publication in The Ellen Glasgow Journal of Southern Women Writers.
Awards and/or Honors: N/A
Post-Graduation Plans (Seniors Only): N/A

Hall, Victoria

Major: English
Faculty Mentor: Karen Taylor
Research/Project Title: Kentucky Philological Review Editorial Assistant
Project Abstract/Summary: Tori will review and edit articles and creative work for publication. She will check for MLA style, formatting, typos etc, as well as participating in editorial meetings and discussion of submitted work. Finally, she will collate readers' comments and produce a revised document for each essay.
Project Dissemination: Kentucky Philological Review (MLA-indexed journal) Volume 38; anticipated publication date August 2024
Awards and/or Honors: N/A
Post-Graduation Plans (Seniors Only): N/A

Hendrix, Holly

Major: Spanish and Global Studies
Faculty Mentor: Philip Krummrich
Research/Project Title: Achieving Conversational Spanish in American Spanish Classrooms
Project Abstract/Summary: It is widely accepted that most Spanish classrooms do not adequately prepare students for real world conversations in Spanish with native speakers. In a world where the need to

communicate in Spanish grows daily, this project aims to identify those barriers and explore methods to improved students' ability to speak and understand spoken Spanish when they leave the classroom. The student worked on the project described above through out the fall semester of 2023, and made a presentation at an Honors conference. Since she spent the spring semester of 2024 studying abroad at the Universidad de Monterrey in Mexico, and with the approval of the Dean, we shifted focus for the spring, and the student resumed working on translations, following up on a successful project from the year before. She plans to publish her translations, and is trying to schedule a reading at Coffeetree Books.
Project Dissemination: Holly presented her work at two Honors conferences, and she will give a reading at Coffeetree Books. She is preparing a second volume of translations for publication. She was not able to present at the Celebration, as she was out of the country.
Awards and/or Honors: N/A
Post-Graduation Plans (Seniors Only): Holly has been accepted into three graduate programs, with full benefits; she is also an alternate for a Fulbright award.

Logan, Christopher

Major: English/Secondary Education
Faculty Mentor: Alison Heron Hruby
Research/Project Title: Preservice English Teachers as Writing Mentors for High School Students: Anti Racist Literature in a Mirrors, Windows, Doors Reading/Writing Curriculum
Project Abstract/Summary: This study examined a Mirrors, Windows, Doors Literature Circles Field Experience Project for MSU undergraduate teacher candidates, a collaboration between two colleges at MSU and an eastern KY school district. The research questions were: (1) What does teacher feedback to student writers look like when the writing experience is structured as anti-racist and discussion-based?; (2) What do the student writers think about the feedback structured as such? The project title (Mirrors, Windows, Doors Literature Circles Field Experience Project) stems from Rudine Sims Bishop's work on expanding reading experiences for students (Bishop, 1990), so that nonwhite students may see themselves reflected in what they read, and so that white students may have windows and doors into perspectives beyond their own (Bishop, 1990). A "Mirrors, Windows, Doors" approach to Literature Circles means that students meet in student-led, teacher-guided small groups (known as Literature Circles) to discuss books by nonwhite authors and about nonwhite characters or people. Literature Circles have recently been adapted in the literacy field to embrace a more critical stance on reading (Thein, Guise, & Sloan, 2011) so that students go beyond summarizing or looking for seemingly neutral literary devices (e.g., symbolism) to examining an author's reification or disruption of harmful systems/social practices (e.g., stereotyping). The study is ongoing, with IRB approval through December 2024. Fall 2023 data collection involved interviewing 4 MSU pre-service English Teachers about their perceptions of working with the high school writers in the Mirrors, Windows, Doors literature circles.
Project Dissemination: Celebration of Student Scholarship 2023 (Poster); the study will also be written as a research article and submitted to a research journal for publication; data analysis is due to begin Fall 2024 with the assistance of two new URFs.
Awards and/or Honors: MSU COSS 2023 MERIT POSTER PRESENTATIONS Caudill College of Arts, Humanities and Social Sciences
Post-Graduation Plans (Seniors Only): Post-graduation plans are to obtain a K-12 teaching job.

McConnell, Lee

Major: English/Secondary Education
Faculty Mentor: Alison Heron Hruby
Research/Project Title: Preservice English Teachers as Writing Mentors for High School Students: Anti Racist Literature in a Mirrors, Windows, Doors Reading/Writing Curriculum
Project Abstract/Summary: This study examined a Mirrors, Windows, Doors Literature Circles Field Experience Project for MSU undergraduate teacher candidates, a collaboration between two colleges at MSU and an eastern KY school district. The research questions were: (1) What does teacher feedback to student writers look like when the writing experience is structured as anti-racist and discussion-based?; (2) What do the student writers think about the feedback structured as such? The project title (Mirrors,

Windows, Doors Literature Circles Field Experience Project) stems from Rudine Sims Bishop's work on expanding reading experiences for students (Bishop, 1990), so that nonwhite students may see themselves reflected in what they read, and so that white students may have windows and doors into perspectives beyond their own (Bishop, 1990). A "Mirrors, Windows, Doors" approach to Literature Circles means that students meet in student-led, teacher-guided small groups (known as Literature Circles) to discuss books by nonwhite authors and about nonwhite characters or people. Literature Circles have recently been adapted in the literacy field to embrace a more critical stance on reading (Thein, Guise, & Sloan, 2011) so that students go beyond summarizing or looking for seemingly neutral literary devices (e.g., symbolism) to examining an author's reification or disruption of harmful systems/social practices (e.g., stereotyping). The study is ongoing, with IRB approval through December 2024. Fall 2023 data collection involved interviewing 4 MSU pre-service English Teachers about their perceptions of working with the high school writers in the Mirrors, Windows, Doors literature circles.

Project Dissemination: Celebration of Student Scholarship 2023 (Poster); the study will also be written as a research article and submitted to a research journal for publication; data analysis is due to begin Fall 2024 with the assistance of two new URFs.

Awards and/or Honors: MSU COSS 2023 MERIT POSTER PRESENTATIONS Caudill College of Arts, Humanities and Social Sciences

Post-Graduation Plans (Seniors Only): Post-graduation plans are to obtain a K-12 teaching job.

Russell, Gracie

Major: English

Faculty Mentor: Philip Krummrich

Research/Project Title: The Amphitryon Theme in Western Literature

Project Abstract/Summary: This ongoing project will include a comprehensive study of the Amphitryon theme in Western literature, from the earliest known examples to the many and diverse interpretations in the 20th century. Ultimately, the student and her mentor expect to publish a translation of one of the plays, with a substantial scholarly introduction. The student has presented two papers on our research at Honors conferences and at the Louisville Conference on Literature and Culture since 1900. She will be submitting written versions of the presentations for publication in undergraduate research journals. We have gathered a great deal of information for the introduction, and we have a rough draft of a translation; at this stage, we are trying to identify a publisher before going further.

Project Dissemination: As noted above, the student has presented at the Kentucky Honors Roundtable twice, and at the Louisville conference. We anticipate that she will be successful in her effort to publish written versions of the presentations.

Awards and/or Honors: N/A

Post-Graduation Plans (Seniors Only): N/A

Department of History, Philosophy, Politics, Global Studies & Legal Studies

Funke, Grace

Major: Political Science

Faculty Mentor: Douglas Mock

Research/Project Title: President Debates and Substantive Responses

Project Abstract/Summary: Analysis over the extent to which televised presidential debates influence the learning of watchers or aid in information gathering about the candidates has already been done. The intention of this research is to examine the content of presidential debates to determine whether the quality of statements in presidential debates changed and to examine the extent to which viewers analyze the responses of the candidates. A ranking system has been created for the purposes of this research that ranks candidate's responses to a question posed by the moderator on a scale of "zero" to "four", with "four" being the presence of an analytical statement and "zero" consisting of vague general statements or a simple non-response to the prompt. This research aims to survey viewers about their analysis beginning with the Kennedy-Nixon debates of 1960 all the way through recent years with the Biden-Trump debates of 2020. The debate will be divided into sections, with responses by the candidates falling under a specific category

such as foreign policy or personal character. Participants will then be asked to rank each candidate in each section of the debate on the scale from “zero” to “four”. The purpose of this research is to identify if a trend exists in relation to relevance and substance of the candidate’s responses as well as whether the quality of these responses have an effect on viewers’ perception of who “won”.
Project Dissemination: Presentation at C.O.S.S. – paper will be submitted for publication when complete
Awards and/or Honors: Outstanding presentation from C.O.S.S
Post-Graduation Plans (Seniors Only): Student will attend law school or graduate school

Lawson, Brady

Major: Political Science
Faculty Mentor: Douglas Mock
Research/Project Title: Presidential Debates and Substantive Responses
Project Abstract/Summary: Analysis over the extent to which televised presidential debates influence the learning of watchers or aid in information gathering about the candidates has already been done. The intention of this research is to examine the content of presidential debates to determine whether the quality of statements in presidential debates changed and to examine the extent to which viewers analyze the responses of the candidates. A ranking system has been created for the purposes of this research that ranks candidate’s responses to a question posed by the moderator on a scale of “zero” to “four”, with “four” being the presence of an analytical statement and “zero” consisting of vague general statements or a simple non-response to the prompt. This research aims to survey viewers about their analysis beginning with the Kennedy-Nixon debates of 1960 all the way through recent years with the Biden-Trump debates of 2020. The debate will be divided into sections, with responses by the candidates falling under a specific category such as foreign policy or personal character. Participants will then be asked to rank each candidate in each section of the debate on the scale from “zero” to “four”. The purpose of this research is to identify if a trend exists in relation to relevance and substance of the candidate’s responses as well as whether the quality of these responses have an effect on viewers’ perception of who “won”.
Project Dissemination: Presentation at C.O.S.S. – paper will be submitted for publication when complete
Awards and/or Honors: Outstanding presentation from C.O.S.S
Post-Graduation Plans (Seniors Only): Student will attend graduate school

Lopez, Michelle

Major: Political Science
Faculty Mentor: Douglas Mock
Research/Project Title: Presidential Debates and Substantive Responses
Project Abstract/Summary: Analysis over the extent to which televised presidential debates influence the learning of watchers or aid in information gathering about the candidates has already been done. The intention of this research is to examine the content of presidential debates to determine whether the quality of statements in presidential debates changed and to examine the extent to which viewers analyze the responses of the candidates. A ranking system has been created for the purposes of this research that ranks candidate’s responses to a question posed by the moderator on a scale of “zero” to “four”, with “four” being the presence of an analytical statement and “zero” consisting of vague general statements or a simple non-response to the prompt. This research aims to survey viewers about their analysis beginning with the Kennedy-Nixon debates of 1960 all the way through recent years with the Biden-Trump debates of 2020. The debate will be divided into sections, with responses by the candidates falling under a specific category such as foreign policy or personal character. Participants will then be asked to rank each candidate in each section of the debate on the scale from “zero” to “four”. The purpose of this research is to identify if a trend exists in relation to relevance and substance of the candidate’s responses as well as whether the quality of these responses have an effect on viewers’ perception of who “won”.
Project Dissemination: Student delivered poster presentation at Celebration of Student Scholarship. Manuscript will be submitted for publication
Awards and/or Honors: Presentation won an award at the Celebration of Student Scholarship
Post-Graduation Plans (Seniors Only): Plans on attending law school.

Thacker, Canaan

Major: Political Science

Faculty Mentor: James Masterson

Research/Project Title: Retrospective and Prospective Impacts on Vote Choice in the 2004 United States Presidential Election

Project Abstract/Summary: The 2004 United States Presidential Election was one of the most significant and monumental election cycles within the previous two decades of electoral history. This election cycle was defined by incumbent Republican candidate George W. Bush, as he was nominated for reelection on the GOP ticket after serving his previous term beginning with his victory in the highly contentious and controversial 2000 United States presidential contest. Multiple issues highlighted the Bush campaign in terms of both security and economics on a national and personalized level. A wide range of the baseline issues of security largely pertained to the importance of defense against terror on both a national and local scale, which was highlighted by the September 11 terrorist attacks on the World Trade Center and the Pentagon, as well as the events that defined their aftermath, such as the militaristic entrance and initiation of conflicts in Afghanistan and Iraq. On an economic basis, these issues largely revolved around "pocketbook" level issues in addition to developments in macroeconomics during the Bush administration of the early 2000's, which pertains to issues such as the tax rate decreases under the administration, the shifts in inflation rates, and the changes in unemployment overall during the incumbent's tenure. Within the 2004 presidential race specifically, the handling of these issues by the incumbent administration would be tested, as George W. Bush faced Democratic Party nominee John Kerry, who was previously a United States Senator from the state of Massachusetts (Crawford n.d.). In a highly contentious race that placed the important economic and security issues on full display on a national scale, George W. Bush defeated John Kerry and won re-election. Bush, within this election cycle, won both the Electoral College and popular vote total.

Project Dissemination: Presented at: Southern Political Science Association, Midwest Political Science Association, Kentucky Political Science Association, and the Celebration of Student Scholarship
Paper is being prepared for publication in Kentucky Journal of Undergraduate Scholarship, Pi Sigma Alpha The Undergraduate Journal of Politics, or Seriatim Journal.

Awards and/or Honors: N/A

Post-Graduation Plans (Seniors Only): N/A

Department of Music, Theater & Dance

Cantrell, Alaina

Major: Music Education

Faculty Mentor: Julie Baker

Research/Project Title: 12 Etudes for Aspiring College Musicians: For the Development of Music Theory and Aural Skill

Project Abstract/Summary: This project explores how to close the gap in music theory and aural skills for incoming flute music students. This etude book is designed to help flute students who do not have a strong background in aural skills or music theory, but still want to major in music. It would serve as an avenue for students to address shortcomings and prepare more fully for the rigorous music theory and aural skills courses encountered in the beginning of their degree. These courses often blindside incoming freshmen and this book would allow them to be prepared and set them up to be successful college musicians. This 12-etude book is designed to incorporate flute-specific etudes, music theory concepts, and aural skills concepts. Aural skills and music theory topics that will be addressed are: singing intervals, chord qualities, sevenths, inversions, and several other music theory and aural skills components. Progress: A review and survey of commonly used music theory and aural skills textbooks has been completed. Five of twelve aural skills/theory workbook pages are complete, four of twelve etudes are in progress.

Project Dissemination: Celebration of Student Scholarship: Poster Presentation (April 17th, 2024)
Music Research Symposium: Poster presentation (March 29th, 2024)

Awards and/or Honors: N/A

Post-Graduation Plans (Seniors Only): N/A

Connelly, Brenden

Major: General Music with Art History Minor

Faculty Mentor: Justin Croushore

Research/Project Title: Special Topics for Music Librarians: Best Practices for Performance and Archival Purposes

Project Abstract/Summary: With this research fellowship, I will complete the following tasks:
Organizing sheet music for individual parts as well as organizing sheet music into filing cabinets for easy access. Maintaining consistency amongst parts by editing musicians' parts by either adding or subtracting writings and effects to enhance the performance. Cooperating with the director and committee for concert themes and providing a list of available repertoires as well as obtaining and ordering new sheet music if the committee requires it.
Results/accomplishments:
Although Brenden's research began in the middle of the academic year (January 2024), Brenden was able to accomplish quite a lot in music library research and with hands-on work as Assistant Librarian with the Cave Run Symphony Orchestra. With guidance from his faculty mentor, Brenden successfully completed the tasks explained in the project summary for two CRSO concert cycles. For each program he was responsible for sheet music organization, editing parts, and managing sheet music folder distribution, collection, and filing. For the 4/21 CRSO program, I was not able to be present for this rehearsal or concert, so Brenden had successfully stepped into the role of the lead on-site music librarian for this cycle. Brenden had also been tasked with reading many books and articles on the topic of music library studies throughout the course of the semester. Through this research, we have determined that we would like to create and eventually publish an up-to-date reference guide for music librarians covering music licensing and performance rights. We hope to continue with this research into the 24-25 academic year and complete this reference guide.

Project Dissemination: Performances:
Cave Run Symphony Orchestra presents "Symphony on Safari" February 25, 2024. Rehearsal 10am-1pm, Concert 3-5pm. Served role as on-site librarian for the rehearsal and concert.
Cave Run Symphony Orchestra presents "Vive la Dance" April 21, 2024. Rehearsal 10am-1pm, Concert 3-5pm. Served role as on-site librarian for the rehearsal and concert.

Awards and/or Honors: Brenden has been named the 2024 Library Fellow for the National Repertory Orchestra, one of the world's premiere training orchestras in Breckenridge, Colorado. The NRO is a prestigious classical music organization featuring the world's leading conductors and students from top music programs including the Julliard School, Curtis Institute of Music, Colburn School, and more.

Post-Graduation Plans (Seniors Only): N/A

Kemper, Emily

Major: BME P-12

Faculty Mentor: Stacy Baker

Research/Project Title: Orofacial Pain and Brass Playing: Causes and Possible Solutions, Innovations, and Therapies

Project Abstract/Summary: This study will examine select sources exploring the causes of orofacial pain in brass playing and possible solutions, innovations, and therapies that may provide relief. Some of these may involve medications; dental solutions such as using a mouthguard to address bruxism; sleep, head, neck, and shoulder hygiene; modifying behaviors through self-help, habit-reversal; alternative therapies such as physical therapy, Feldenkrais Method, Alexander Technique, yoga, meditation, and acupuncture; and brass instrument/mouthpiece design alterations/innovations.

Project Dissemination: Poster(s) and Oral Presentation(s):
Kemper, Emily and Professor, Stacy Baker (2024, March). TMD and its Effects on Brass Playing, poster, Music Research Symposium, Morehead, KY, March, 2024.
Performance(s):
Kemper, Emily. Yorkshire Ballad by James Barnes. Brass Juries, Morehead, KY, May, 2024.

Awards and/or Honors: Music Award for Current Music Major Spring 2023 $1000

Post-Graduation Plans (Seniors Only): N/A

Pierce, Hadley R.

Major: Theatre Education
Faculty Mentor: Octavia Biggs
Research/Project Title: The Little Company Inspiring Growth One Show at a Time!
Project Abstract/Summary: Practical application for theatre education experience in the following areas: public classrooms, performance workshops, study guide development, assistant tour manager, office assistant to the director, in house Little Company public relations officer, assisting in the preparation of tour, etc. The Little Company, for the season 2024 Spring Tour, had a fabulous and successful season. We traveled to 16 schools and performed for over 3500 children in the MSU service region. Hadley built and published the co-curricular study guide and it was shared with every teacher in each of our schools. She also developed the lesson plans within the study guide and helped to implement the drama lesson plan based on the Core Content for Kentucky schools taught following the performances. Hadley was responsible for taking the tour out on the road several times. She also worked with the tour manager to contact schools to book the company and to collect the payment for the tour.
Project Dissemination: Study Guide:
STUDENT: Pierce, Hadley and instructor O. Biggs (2024) "Jacks' Adventure With The Kings' Girl Study Guide".
Lesson Plan creation:
STUDENT: Pierce, Hadley and instructor O.Biggs (2024) Drama Lesson Plan, "Found Object Puppetry".
Oral Presentation
STUDENT: Pierce, Hadley and instructor O.Biggs (2024) "Inspiring Growth One Show at a Time". Celebration of Student Scholarship, Morehead, KY, April, 2024.
Awards and/or Honors: Certificate of Student Schoalrship-Certificate of Exceptional Merit-Pierce, Hadley "Inspiring Growth One Show at Time" (2024)
Post-Graduation Plans (Seniors Only): N/A

Department of Sociology, Social Work & Criminology

Akers, Megan

Major: Sociology
Faculty Mentor: Bernadette Barton
Research/Project Title: Mythbusting: Transgender Truths & Transgender Joy: A Path To Resisting Oppression
Project Abstract/Summary: "Mythbusting: Transgender Truths" is a short, educational lecture whose purpose is to name and dispel common myths about transgender people, namely those spread by political pundits in dangerous misinformation campaigns. The myths we elaborate on are that 1) transgender people are a new phenomenon, 2) transgender people are dangerous to society (and women), 3) children are being recruited and mentally/physically hurt by transgender people, and 4) people often regret transitioning to another gender. Throughout the presentation, each of these ideas is elaborated upon and challenged with examples of scholarly and historical facts. These myths scapegoat transgender people and fuel bigoted beliefs. This presentation responds to a charged political climate rife with misinformation with the intention of providing an accurate foundation for cisgender and transgender people alike to engage with transgender issues. Posters at The Capital Abstract for Mythbusting: Transgender Truths- Drawing on in-depth qualitative interviews with 17 transgender and nonbinary people, this poster dispels contemporary myths about transgender people spread in misinformation campaigns that scapegoat trans people and fuel bigoted beliefs. The myths we refute are that 1) transgender people are a new phenomenon, 2) transgender people are dangerous to society (and women), 3) children are being recruited and mentally/physically hurt by transgender people, and 4) people often regret transitioning to another gender.
Transgender Joy: A Path To Resisting Oppression- Drawing 29 on in-depth qualitative interviews, ranging in age from 21 to 73, this study explores transgender people's response to the ongoing anti-transgender legislation around the country and its relationship to transgender joy. We define transgender joy as a

multifaceted term which encompasses the combination of gender euphoria, community, authenticity, and autonomy that result from being transgender. With this data we question the relationship between anti-transgender political campaigns and transgender joy and contend with the question of whether transgender joy is a meaningful path to resistance to anti-LGBTQ+ and anti-transgender legislation. We consider anti-transgender political campaigns as any bills introduced as legislation that seeks to restrict the civil rights and bodily autonomy of transgender people. The ACLU is currently tracking 479 anti-LGBTQ+ bills nationwide, and 13 in Kentucky, so far in the 2024 legislative session. The size and scope of these campaigns nationwide makes scholarship centering transgender people imperative to understanding the current social and political zeitgeist. These bills are harmful to transgender people's mental and physical well-being, and this harm impacts transgender people's lived experience. We suggest that transgender joy can be harnessed as a possible antidote to the distress we are seeing surrounding anti-transgender political campaigns.

Project Dissemination: Poster(s) and Oral Presentation(s):

Students, Megan A. and Stephanie P. and Professor, Barton B. (2023, October). Mythbusting: Transgender Truths, lecture, 3rd Annual Justice Festival, Morehead, KY, October, 2023.

Students, Megan A. and Stephanie P. and Professor, Barton B. (2024, March). Mythbusting: Transgender Truths, poster, Posters at the Capital, Frankfort, KY, March, 2024

Student, Megan A. and Professor, Barton B. (2024, April). Transgender Joy: A Path To Resisting Oppression, oral presentation, Celebration of Student Scholarship, Morehead, KY, April, 2024.

Awards and/or Honors: Oral Presentation Certificate of Merit at Celebration of Student Scholarship, 2024
Outstanding Undergraduate Student in Gender Studies, Caudill College Awards, 2024

Post-Graduation Plans (Seniors Only): N/A

Beard, Adrianna

Major: Criminology and Criminal Justice

Faculty Mentor: Amanda London

Research/Project Title: The Effects of Cognitive Behavioral Therapy Programs on Recidivism Rates.

Project Abstract/Summary: We are challenged with the question of whether cognitive behavioral therapies work, or do they allow individuals to better blend into society without changing behavioral issues? So far, we have looked at different cognitive behavioral therapy programs, and their effects on the participants. The goal is to create a presentation that highlights the effect of cognitive behavioral therapy programs within the prison system, and the impact those have on recidivism rates.

Project Dissemination: N/A

Awards and/or Honors: N/A

Post-Graduation Plans (Seniors Only): N/A

Fitch, Matthew

Major: Criminology & Criminal Justice

Faculty Mentor: Elizabeth Perkins

Research/Project Title: Exploring Compassion Fatigue Among Animal Shelter Workers: A Survey of Both Rural and Urban Counties

Project Abstract/Summary: The purpose of this study is to explore the extent of compassion fatigue among shelter workers in urban and rural counties in Kentucky. In addition, we examined the "care and kill" phenomenon and its prevalence in animal shelters across the state and its effect on shelter worker resilience. Understanding this phenomenon among Kentucky animal shelter workers' struggle and angst could increase the quality of life for employees. Qualitative data were gathered through internet and mailed questionnaires. Questionnaires were sent to directors and workers (paid and/or volunteer) at animal shelters who volunteered to anonymously participate in the study. Common themes emerged from the qualitative data, including: Disheartening feeling about euthanasia, failed or complete lack of positive coping strategies, feelings of hopelessness, lengthy rationalizations of mandatory medical actions on the animals due to the compassion of workers, prevalence of responses advising against attachment to animals inside the shelter.

Project Dissemination: Fitch, Matthew, Perkins, E., &Tallichet, S. (April 2024). Worth its Weight in Gold: Compassion Fatigue in Kentucky Animal Shelter Workers. Poster presented at the MSU Annual Celebration of Student Scholarship.
Awards and/or Honors: N/A
Post-Graduation Plans (Seniors Only): N/A

Lascola, Valerie

Major: Biological Sciences/Criminology
Faculty Mentor: Elizabeth Perkins
Research/Project Title: Chemistry in a Romantic Relationship
Project Abstract/Summary: "If I don't catch feelings, it's over" is a phrase which reflects the importance of "Love at first sight" or romantic chemistry as a criterion for continuing a relationship. Yet a review of the literature for the last 20 years revealed little research on the topic of romantic chemistry. Love, intimacy, desire and arousal topics abound, but not romantic chemistry- the subject of this research. A 33 -item internet survey was approved by the Institutional Review Boards at the respective universities and completed by undergraduates at East Carolina University, University of Central Missouri, and Morehead State University undergraduates, Fall 2023. Two-hundred and ninety-eight undergraduates (79.2% female,79.2% heterosexual, and 70.8% white with an average age of 20.68) at three universities completed an anonymous, voluntary 33-item survey. Eighty-one percent reported having experienced romantic chemistry at least once. Intellectual banter (57.3%), similarity in age/race/values (43.9%), being ready for a new love connection (37.5%), and sexual attraction (35.8%) were identified as factors facilitating "romantic chemistry." While 30.5% thought romantic chemistry was unknowable/mysterious/unexplainable, others suggested "energetic alignment," "brain wiring," "soul matching," "similar vibe" and "smell" as important factors. There were no significant differences by gender, sexual orientation or race in reporting having experienced romantic chemistry. The symbolic interaction/social exchange theoretical frameworks are used to explain romantic chemistry.
Project Dissemination: Hill, A., Lewis, B., Chang, I.J., Perkins, E., Lascola, V., Knox, D. (April 2024). Romantic Chemistry Among Undergraduates. Poster presented at the Southern Sociological Society Annual Conference, New Orleans, LA.
Awards and/or Honors: N/A
Post-Graduation Plans (Seniors Only): Valerie plans to attend graduate school in the Fall. She is in the process of deciding which school (she had multiple offers).

Perry, Stephanie

Major: Sociology
Faculty Mentor: Bernadette Barton
Research/Project Title: Mythbusting: Transgender Truths & Gender Inclusive Restrooms at Morehead State University
Project Abstract/Summary: "Mythbusting: Transgender Truths" is a short, educational lecture whose purpose is to name and dispel common myths about transgender people, namely those spread by political pundits in dangerous misinformation campaigns. The myths we elaborate on are that 1) transgender people are a new phenomenon, 2) transgender people are dangerous to society (and women), 3) children are being recruited and mentally/physically hurt by transgender people, and 4) people often regret transitioning to another gender. Throughout the presentation, each of these ideas is elaborated upon and challenged with examples of scholarly and historical facts. These myths scapegoat transgender people and fuel bigoted beliefs. This presentation responds to a charged political climate rife with misinformation with the intention of providing an accurate foundation for cisgender and transgender people alike to engage with transgender issues.
Posters at The Capital Abstract for Mythbusting: Transgender Truths- Drawing on in-depth qualitative interviews with 17 transgender and nonbinary people, this poster dispels contemporary myths about transgender people spread in misinformation campaigns that scapegoat trans people and fuel bigoted beliefs. The myths we refute are that 1) transgender people are a new phenomenon, 2) transgender people

are dangerous to society (and women), 3) children are being recruited and mentally/physically hurt by transgender people, and 4) people often regret transitioning to another gender.
Celebration of Student Scholarship Abstract for Gender Inclusive Restrooms at Morehead State University While attending Morehead State University, we observed a lack of accessible gender-neutral restrooms for transgender and nonbinary people on our campus. During the fall and spring semesters, we have engaged in the community work of getting gender-neutral signs for the designated single-use restrooms, sharing knowledge of the specific locations for gender-neutral restrooms, and creating the first multi-stall universal restroom on the main Morehead State campus. The campus currently has 26 gender-neutral restrooms scattered across university buildings that are only identifiable as "family" or by a total lack of signage. In order to begin the conversation surrounding inclusivity on our campus, we engaged with the community through open conversations and petitions with both faculty staff and students. Those conversations were met with curiosity and support for ensuring a safe and gender affirming environment for each individual who works or studies on the main campus. We worked toward creating a more inclusive environment that catered to all the needs of faculty staff and students, regardless of their gender identity. This presentation describes the rationale for gender inclusive restrooms, and the efforts we took to identify and increase them at Morehead State University.

Project Dissemination: Posters and Oral Presentation:

Students, Megan Akers and Stephanie Perry and Professor, Barton B. (2023, October). Mythbusting: Transgender Truths, oral presentation, 3rd Annual Justice Festival, Morehead, KY, October, 2023.

Students, Megan Akers and Stephanie Perry, and Professor, Barton B. (2024, March). Mythbusting: Transgender Truths, poster presentation, Posters at the Capital, Frankfort, KY, March, 2024

Student, Stephanie Perry and Professor, Barton B. and Professor Hardesty C. (2024, April). Gender Inclusive Restrooms at Morehead State University, poster presentation, Celebration of Student Scholarship, Morehead, KY, April, 2024**.**

Awards and/or Honors: Poster Presentation, Certificate of Exceptional Merit at Celebration of Student Scolarship, 2024

Outstanding Undergraduate Student in Gender Studies, Caudill College Awards, 2024

Post-Graduation Plans (Seniors Only): N/A

Stallings, Talon

Major: Criminology

Faculty Mentor: Elizabeth Perkins

Research/Project Title: An Eye for an Eye: How Revenge is Viewed as a Motive

Project Abstract/Summary: Motives behind crimes play a large role in sentencing. A motive is defined as "the reason for doing something." (Oxford Dictionary, 2023) In criminal cases, this translates to the reason for committing a crime. It's well known that different criminal motives elicit different reactions from members of the public. (Wolfgang, 1958) This often leads to differences in sentencing. One of the most well known motives in crime is revenge, which is the act of criminally retaliating against one who a criminal believes has wronged them. (Kivivuori, 2016) In this research study, public opinion will be gauged on how revenge is viewed as a criminal motive. Using surveys of different age ranges, a representative sample of US citizens will give their opinion on revenge crimes. Objectives: The goal of this survey is to better understand how revenge is viewed by the average person. Revenge is often viewed as an ugly and vile reason for doing something in literature (McClelland, 2010), but is that always the case in real life? In this survey we want to find where the line may be drawn in an average citizen's mind to determine what justifies revenge and taking the law into one's own hands. Preliminary Literature Review: Current literature relating to revenge is more closely related to philosophy and sociological standards than how the average person views a criminal act of revenge. Some research looks at revenge as a personal motive and studies the controversy surrounding the feelings of relief that come with revenge (McClelland, 2010) while others look at how revenge could be learned or taught (Kivivuori, Savolainen, & Aaltonen, 2016). What is currently missing is exactly how citizens react to revenge as a motive. In this research study, we are more interested in the way an average person reacts to an act of revenge and what kind of punishments they may feel are apt for these kinds of offenders.

Project Dissemination: During Fall 2023, we worked on the literature review and developed the survey instrument. In Spring 2024, we completed the IRB paperwork for approval and launched the survey. We had approximately 200 participants in our survey. In Fall 2024, we plan to analyze survey results and present the findings at a regional conference (most likely Mid-South Sociological Association in Nashville)
Awards and/or Honors: N/A
Post-Graduation Plans (Seniors Only): N/A

College of Science & Engineering

Agricultural Sciences

Adkins, Caroline

Major: Agribusiness
Faculty Mentor: Vijay Subramaniam
Research/Project Title: Economic Analysis of Hay and Corn Production at Morehead State University's Derrickson Agricultural Complex
Project Abstract/Summary: Morehead State University's Derrickson Agricultural Complex (DAC) produces several agricultural enterprises and provides valuable hands-on experiences for students. The major goal of DAC is to prepare students for future careers in agriculture by enhancing classroom learning and introducing new and efficient farming technologies. Hay and corn are the two most dominant crop enterprises which cover 58 percent of total areas. In addition, the DAC produces hay from 6 different farms using the crop-share leasing method. The primary objective of this study is to analyze the profitability of hay and corn production at the DAC and leased farms. Two years of data were collected and the profitability of hay and corn for each farm was calculated separately, using several farm-specific enterprise budgets. This poster will illustrate the yields, profits, and strengths and weaknesses of each farm. The research will contribute to a deeper understanding of the economic sustainability and viability of hay and corn production at the DAC, thereby informing better decision-making and optimization of agricultural enterprises on the farm.
Project Dissemination: Poster presentation at Morehead State University's Celebration of Student Scholarship
Awards and/or Honors: N/A
Post-Graduation Plans (Seniors Only): N/A

Canaday, Austin

Major: Agribusiness
Faculty Mentor: Amy Collick
Research/Project Title: Field-Scale Data Generation for Regional Watershed Modeling Development using Historical Field Management Surveys and the Introduction of Drone Monitoring Techniques (former title, Field-Scale SWAT+ Modeling to Support Regional Legacy P Model Development)
Project Abstract/Summary: Existing Soil and Water Assessment Tool Plus (SWAT+) models will be adapted to better represent the conditions at field research sites located in major river basins across the US, including the Mississippi River basin where Morehead State University is situated. Models developed for the National Argo-ecosystems Model (NAM) will be used as a starting point to parameterize field scale SWAT+ models of individual research sites collecting legacy phosphorus data and aid in the development of enhanced model routines to better predict legacy phosphorus dynamics. Deficiencies in SWAT+ predictions for legacy P dynamics at the field scale will be identified and addressed if possible in cooperation with the SWAT+ development team. Models will be parametrized, calibrated, and validated as needed at the field scale for each research site. Currently, datasets from each watershed team are being collected, organized, and formatted for use in the SWAT+ modeling framework. These include weather, stream and field flow monitoring, water quality, field crop management, soil physical and chemical conditions. As part of the undergraduate research fellowship (URF), the URF student has worked with field management datasets to transcribe hand-written surveys into digital files for easier integration into the model framework. As an additional part of the project, the URF student has investigated the use of

unmanned aerial vehicles (UAVs or drones) to facilitate field data collection and application in SWAT+ as well as provide opportunities for MSU Agricultural Sciences students with additional, innovative skillsets for their career pathway.

UAVs have emerged as a leading technological innovation to improve the efficiency and productivity of cropped fields. Emerging in the 1960s, drones have evolved with high-tech applications (automation, GPS-tracking, and multi-spectral cameras) and are used to map crop fields, spray amendments, and scout crops. Drones can now scan and survey fields autonomously, saving the farmers an impressive amount of time and effort (Villanueva, 2023). Since 2023, at the Derrickson Agricultural Complex at MSU, we have expanded Agricultural Sciences students' capabilities with drones by developing flight procedure documentation, testing piloting skills, and conducting crop field evaluations. It began with the URF student developing flight setup and take-off procedures, then progressed to flying the drone to scout for damaged or diseased crops. The final step involves downloading GPS data from the drone's internal storage for individual flights and uploading it to mapping software to be able to tie photos and clips from the video to exact positions on the drone's flight path.

This allows the data and images to be easily shared and viewed by the farm manager who can evaluate the data to make any adjustments to field management and to review the health status of growing crops. Geographically-specific field management data can also be processed for use in informing watershed models, such as SWAT+. Crop growth and production, soil conditions, and other field management information can be integrated into the models for better field management representation and enhanced corroboration of model results.

Project Dissemination: Poster Presentation:

Canaday, A. and A.S. Collick. (2024, April) Drone Technology on the Farm: Derrickson Agricultural Complex, Morehead State University (MSU). Poster Presentation. Annual Celebration of Student Scholarship, Morehead State University, Morehead, KY.

Training Manuals for use in Agronomy and Precision Agriculture Courses offered in the Department of Agricultural Sciences: Holy Stone Drone Flight Instructions for Smart Phone and Remote Controller; Insire 1 Flight Instructions; Drone Flight Record Conversion to GIS shape files; Report on precision soil sampling for improved nutrient management

Awards and/or Honors: Received Outstanding Student of Agribusiness for the College of Science and Engineering Honors Day, April 2024

Post-Graduation Plans (Seniors Only): Hired immediately upon graduation as an Engineering Technician for L3Harris, an innovative, fast-moving company involved in the development of technology to face global challenges. He will be involved in testing, repairing, and building computer and digital components for different clients, including the US military.

Millay, Luke

Major: Agribusiness

Faculty Mentor: Vijay Subramaniam

Research/Project Title: Economic Analysis of Hay and Corn Production at Morehead State University's Derrickson Agricultural Complex

Project Abstract/Summary: Morehead State University's Derrickson Agricultural Complex (DAC) produces several agricultural enterprises and provides valuable hands-on experiences for students. The major goal of DAC is to prepare students for future careers in agriculture by enhancing classroom learning and introducing new and efficient farming technologies. Hay and corn are the two most dominant crop enterprises which cover 58 percent of total areas. In addition, the DAC produces hay from 6 different farms using the crop-share leasing method. The primary objective of this study is to analyze the profitability of hay and corn production at the DAC and leased farms. Two years of data were collected and the profitability of hay and corn for each farm was calculated separately, using several farm-specific enterprise budgets. This poster will illustrate the yields, profits, and strengths and weaknesses of each farm. The research will contribute to a deeper understanding of the economic sustainability and viability of hay and corn production at the DAC, thereby informing better decision-making and optimization of agricultural enterprises on the farm.

Project Dissemination: Poster presentation at Morehead State University's Celebration of Student Scholarship
Awards and/or Honors: N/A
Post-Graduation Plans (Seniors Only): N/A

Phipps, Annabel J.
Major: Veterinary Science
Faculty Mentor: Pedro De Pedro
Research/Project Title: Safety of Nebulization of Allogenic Alpha-2 Macroglobulin in Horses
Project Abstract/Summary: Horses with recurrent airway obstruction (RAO) exhibit airway inflammation and increased respiratory efforts at rest. The clinical signs of RAO can be reversed through administration of corticosteroids, bronchodilators, or changing the environment. This study was conducted to test the safety and effectiveness of nebulized alpha-2 macroglobulin (α2M) in treating airway obstruction and inflammation. The α2M molecule has been shown to be an anti-inflammatory agent in horse's joints and soft tissue using the Alpha2EQ treatment by Astaria. In this study, six horses received nebulizer treatments seven times each, being assessed prior to each treatment and one hour after each treatment. These assessments included rectal temperature, heart rate, respiratory rate, presence or absence of coughing, and results of auscultation of the lungs. Other assessments could be made at the discretion of the principal investigator. The α2M came from one of two donor horses who fit certain inclusion criteria. The first six treatments happened 48 hours apart and the last treatment occurred 20 days after the sixth. Blood was drawn periodically to check the horse's complete blood count (CBC), serum chemistry, and fibrinogen. The horses received no additional treatments during the course of the study.
Project Dissemination: Presentation:
Phipps, Annabel J. (2024, April). *Safety of Nebulization of Allogenic Alpha-2 Macroglobulin in Horses*, poster, Celebration of Student Scholarship, Morehead, KY, April, 2024.
Awards and/or Honors: N/A
Post-Graduation Plans (Seniors Only): N/A

Walsh, Madeline
Major: Agricultural Sciences
Faculty Mentor: Patricia Harrelson
Research/Project Title: Relationships among maternal characteristics in hair sheep
Project Abstract/Summary: Since the spring of 2022, the MSU sheep flock has been an Innovation Flock for the Sheep GEMS project, managed by the University of Nebraska-Lincoln. The GEMS project is a multi-breed, national project evaluating longevity of ewes within flocks. Our part as a participant in the project involves collecting and sending raw data which is compiled into 1 very large data set. The research discussed here uses our preliminary data from the 2022, 2023, and 2024 lambing seasons collected from our Katahdin ewes (n =46; 1-5 years of age).
Collected data included fecal egg count (FEC), body condition scoring (BCS), FAMACHA scores, teat and udder scores. Data were analyzed using the CORR procedure in SAS with a significance level set at $P < 0.05$. Udder depth provided the most correlations, including a negative relationship ($r = - 0.21$) with ewe age and a negative relationship ($r = - 0.21$) with FAMACHA. There was also a negative correlation ($r = - 0.21$) between udder depth and BCS. Furthermore, ewe age was negatively related ($r = - 0.28$) to FEC. Unsurprisingly, there was a positive relationship ($r = 0.22$) between udder and teat scores. Also, the BCS was positively correlated ($r = 0.21$) with mastitis incidence. The results of this project underline the importance of multiple traits which could contribute to ewes leaving the flock early.
Project Dissemination: Co-authored a poster at the Celebration of Student Scholarship, April 2024, titled: "Impact of Year and Animal Origin on Key Factors of Ewe Longevity"
Awards and/or Honors: Received a merit award her poster at the Celebration of Student Scholarship, April 2024.
Post-Graduation Plans (Seniors Only): N/A

Biology & Chemistry

Baker, Zoe

Major: Biology

Faculty Mentor: David Eisenhour

Research/Project Title: Life-history of the Popeye Shiner, Notropis ariommus, and the Highland Shiner, Notropis micropteryx, in the Rockcastle River, Kentucky.

Project Abstract/Summary: For two minnow species with unstudied life-history, the Popeye Shiner and the Highland Shiner, we will document two aspects of their life history: (1) age and growth and (2) reproductive cycle. Specimens will be from a population in the Rockcastle River, and include previously-collected specimens, and new specimens collected on a monthly basis, as flow conditions permit. Age and growth will be documented by length-frequency analysis, supplemented by examinations of scale annuli. Reproductive cycle will be documented by size and conditions of gonads, especially using a gonadosomatic index.

We have collected data from over 500 captured, preserved specimens, in addition to some length-frequency data from over 1000 released specimens. We have documented that these fishes live to a maximum or 2-3 years and are reproductively mature by 12 or 24 months of age. Gonad sizes are high from April to early June, but then rapidly decline after that, indicating a spawning season from about late April to very early June.

The results collected help managers of biodiversity protect these fishes and other aquatic resources. For example, this suggests the most sensitive time (reproduction) occurs in late Spring and major disturbances to streams (e.g., replacing a bridge) should not be done at this time.

Project Dissemination:

2023. Black, S., J. Vise, Z. Baker, C. Senters, and D. J. Eisenhour. Life history of a minnow: growth and reproduction of the Popeye Shiner (Notropis ariommus) in the Rockcastle River, Kentucky. Kentucky Academy of Science, Northern Kentucky University, November and Southeastern Fishes Council, November.

2023. Baker, Z., C. Senters, S. Black, J. Vise, and D. J. Eisenhour. Age, growth, and reproductive cycle of the Highland Shiner (Notropis micropteryx) in Rockcastle River, Kentucky. Kentucky Academy of Science, Northern Kentucky University, November and Southeastern Fishes Council, November.

2024. Baker, Z. C. Senters, and D. J. Eisenhour. Reproductive cycle of the Highland Shiner (Notropis micropteryx) in Rockcastle County, Kentucky. Celebration of Student Scholarship, Morehead State University (April, poster).

2024. Senters, C., Z. Baker, and D. J. Eisenhour. Age and growth of the Highland Shiner (Notropis micropteryx) in Rockcastle County, Kentucky. Celebration of Student Scholarship, Morehead State University (April, poster).

Awards and/or Honors: At KAS, Both posters were given highest award – "Thoroughbred"

At CSS, Zoe was a coauthor on a poster that was awared "highest merit".

Post-Graduation Plans (Seniors Only): Zoe is graduating in May and has been accepted to optometry school in Pikeville.

Ball, Darion

Major: Biology

Faculty Mentor: Allen Risk

Research/Project Title: Biogeography of the Lichens of Carter Caves State Resort Park, Carter County, Kentucky

Project Abstract/Summary: Lichens are a complex symbiosis made of two components: a fungus and an organism capable of producing food, either green algae or cyanobacteria. Lichens are a vital part of forest ecosystems; those containing cyanobacteria are able to convert nitrogen in the atmosphere into usable nitrogen compounds for plants in the surrounding area. They are one of the first pioneers in a new environment, able to colonize rocks, soil, bark, and wood. The primary objective of this study was to determine the biogeographic category representation shown by the lichens of the park. The most common biogeographic categories were east temperate (53% of the species), pan-temperate (28%), Appalachian-Great Lakes (16%), and and Coastal Plain (3%). The Carter Caves populations of Pyrenula ravenelii and

Pseudosagedia rhaphidosperma represent some of the northernmost occurrences of these southeastern species. This work was supported by a Morehead State University Undergraduate Research Fellowship and a travel grant from the Department of Biology and Chemistry at Morehead State University.
Project Dissemination: Biogeography of the Lichens of Carter Caves State Resort Park, Carter County, Kentucky. Ball, D. and A. C. Risk. 2024. Celebration of Student Scholarship, Morehead State University, Morehead, KY.
Awards and/or Honors: N/A
Post-Graduation Plans (Seniors Only): Begin the 4+1 Master's program in biology at MSU.

Baughman, Serenity

Major: Chemistry
Faculty Mentor: Emmalou Schmittzehe
Research/Project Title: Comparison of Nicotine Quantification in E-Liquids using Volume-Based Sample Preparation versus Mass-Based Sample Preparation
Project Abstract/Summary: There is great interest surrounding the accuracy of the reported levels of nicotine contained in e-liquids. Many studies show significant inconsistencies in the amount of nicotine reported on e-liquid product labels and the amount of nicotine detected in the e-liquids. The current methods rely on preparing e-liquids for analysis by performing dilutions based on volume, but due to the viscosity of the liquids this preparation technique is prone to method errors. The aim of this project was to compare the nicotine content in samples prepared by volume to those prepared by mass. This was done by first measuring the densities of several e-liquids. Those densities were used to convert the volume-based preparation into a mass-based preparation. Nicotine content in samples prepared by mass and by volume were then measured by high-performance liquid chromatography (HPLC). It was hypothesized that the samples prepared by mass would show a higher nicotine content than the samples prepared by volume due to incomplete transfer of the viscous e-liquids in the volume preparation, but this was not consistent across the samples. In addition, results from both preparation techniques indicated that the nicotine content in the majority of the analyzed e-liquids contain less nicotine than reported on the label.
Project Dissemination: Baughman, Serenity J. and Schmittzehe, Emmalou T. (2024, April). Comparison of Nicotine Quantification in E-Liquids using Volume-Based Sample Preparation versus Mass-Based Sample Preparation, poster, Celebration of Student Scholarship, Morehead, KY, April, 2024.
Awards and/or Honors: N/A
Post-Graduation Plans (Seniors Only): N/A

Blair, Marissa

Major: Chemistry
Faculty Mentor: Zachary Lee
Research/Project Title: Predicting the Reactions of CS2, OCS, and CO2 with Group IV and Group VI Transition Metal Oxide
Project Abstract/Summary: Building on a recent serious of high level electronic structure studies of Lewis acid gas reactions with metal oxide sorbents, DFT (B3LYP and ωB97X-D) and CCSD(T) methods were used to predict the Lewis acid-base addition (physisorption) and formation of metal oxide carbonate/thiocarbonate formation (chemisorption) reactions of CS2, OCS, and CO2 with Group IV $(MO2)_n$ and Group VI $(MO3)_n$ (n = 1 - 3) nanoclusters. For the Group IV oxides, chemisorption to form terminal carbonates and thiocarbonates was predicted to be the most favored, with thiocarbonate ligand binding energies slightly more exothermic than their carbonate analogues, consistent with the small differences in the CS2 C=S (105 kcal/mol) and CO2 C=O (127 kcal/mol) bond energies. For Group VI, only weak physisorption (< 10 kcal/mol exothermic) was predicted to occur for CO2, CS2, and OCS. These results are consistent with our previous studies of CO2, NO2, SO2, and H2O adsorption to Group IV and Group VI metal oxide clusters. The results of this work could have implications for the sequestration of CS2 from high-sulfur areas of arctic permafrost and also provides mechanistic insights into the possible reactions and products of OCS- and CS2-induced TiO2 degradation during the Claus Process.
Project Dissemination: 2024 MSU Celebration of Student Scholarship – Poster Presentation:
Predicting the Reactions of CS2, OCS, and CO2 with Group IV and Group VI Transition Metal Oxides.

Poster Presentation, 2024 Annual Morehead State University Celebration of Student Scholarship, Morehead, Kentucky, April 2024

Predicting the Reactions of CS2, OCS, and CO2 with Group IV and Group VI Transition Metal Oxides. Poster Presentation, 2024 Posters-at-the-Capitol, Frankfort, Kentucky, March 2024

Awards and/or Honors: 2024 MSU Celebration of Student Scholarship Merit Award Departmental Award - Spring 2024 Outstanding Junior Chemistry Researcher

Post-Graduation Plans (Seniors Only): N/A

Carnes, Jacob

Major: Biology

Faculty Mentor: Allen Risk

Research/Project Title: Lichens of Carter Caves State Resort Park, Carter County, Kentucky

Project Abstract/Summary: Lichens are a complex symbiosis made of two components: a fungus and an organism capable of producing food, either green algae or cyanobacteria. Lichens are a vital part of forest ecosystems; those containing cyanobacteria are able to convert nitrogen in the atmosphere into usable nitrogen compounds for plants in the surrounding area. They are one of the first pioneers in a new environment, able to colonize rocks, soil, bark, and wood. The primary objective of this study was to make progress on a lichen species inventory for Carter Caves State Resort Park through field work and examination of previous collections housed in the herbarium of Morehead State University. 170 species of lichens have been documented in the park thus far including several rare/uncommon species such as Scytinium apalachense, Circinaria contorta, Collema pustulatum, Lathagrium fuscovirens, Bilimbia fuscoviridis, and Thyrea confusa. This work was supported by a Morehead State University Undergraduate Research Fellowship and a travel grant from the Department of Biology and Chemistry at Morehead State University.

Project Dissemination: N/A

Awards and/or Honors: N/A

Post-Graduation Plans (Seniors Only): N/A

Gibson, Cameron

Major: Premed

Faculty Mentor: Smita Joshi

Research/Project Title: Vesicle-Associated Membrane Proteins (VAMPs) Regulate Platelet Cargo Levels

Project Abstract/Summary: Platelets are crucial to maintaining the vascular microenvironment. Upon vascular injury, they interact with extracellular matrix proteins and release cargo contents from their granules. De-novo synthesized or endocytosed cargo travel through specialized compartments like endosomes and are packaged in granules. These cargo molecules are important in inflammation, immunity, wound healing, and many other processes. Platelet granule release is mediated by Soluble N-thylmaleimide Sensitive Factor Attachment Protein Receptors (SNAREs) and their regulators. Apart from granule secretion, the VAMPs also play a role in intracellular trafficking. Platelets contain Vesicle-Associated Membrane Protein (VAMP)-2, -3, -4, -5, -7, and -8. To study how VAMPs regulate platelet cargo levels, we generated several VAMP-deficient mouse strains that lack either one or combinations of VAMPs. The theoretical levels of VAMPs in these platelets vary from 100% to about 15% based on previous mass-spec and quantitative blotting analysis. Using commercial antibody arrays, we probed for 53 different cargo proteins in VAMP-deficient platelets. Cargo levels were minimally affected (relative to wild-type) in VAMP7-/- platelets and drastically reduced in NBL2-/- platelets. (NBL2 is a sorting protein whose deletion causes Grey Platelet Syndrome). While all strains showed some decreases, VAMP-(2/3)Δ/Δ(7/8)-/- and VAMP-(2/3)Δ/Δ(8)-/- platelets showed significant reductions. These patterns suggest that all VAMP isoforms contribute to platelet cargo trafficking to some extent. The data further suggest that cargo distribution is stochastic, non-thematic, and could be regulated by overlapping functions of the VAMPs. This is the first report indicating the relative contributions of VAMPs in platelet trafficking on a global level.

Project Dissemination:

Gibson, C. and Joshi, S. (2024, March). “Vesicle-Associated Membrane Proteins/VAMPs Regulate Platelet

Cargo Levels". KY INBRE Annual Conference, Lexington, KY. Student talk.

Gibson, C., McFarland, J., Whiteheart, S. W., and Joshi, S. (2024, March). "Vesicle-Associated Membrane Proteins/VAMPs Regulate Platelet Cargo Levels". KY INBRE Annual Conference, Lexington, KY. Poster Presentation

Gibson, C. and Joshi, S. (2024, April). "Vesicle-Associated Membrane Proteins/VAMPs Regulate Platelet Cargo Levels". Celebration of Student Scholarship Student talk.

Awards and/or Honors: Certificate of Merit award at the annual Celebration of Student Scholarship symposium at Morehead State University

Post-Graduation Plans (Seniors Only): Planning to take MCAT examination and apply to medical schools.

Fitzpatrick, Julia

Major: Biology

Faculty Mentor: Allen Risk

Research/Project Title: Jams, Jellies, and Jelly Lichens of Carter Caves State Resort Park, Carter County, Kentucky

Project Abstract/Summary: Lichens are a complex symbiosis made of two components: a fungus and an organism capable of producing food, either green algae or cyanobacteria. Lichens are a vital part of forest ecosystems; those containing cyanobacteria are able to convert nitrogen in the atmosphere into usable nitrogen compounds for plants in the surrounding area. They are one of the first pioneers in a new environment, able to colonize rocks, soil, bark, and wood. The primary objective of this study was to make progress on a jelly lichen species inventory for Carter Caves State Resort Park through field work and examination of previous collections housed in the herbarium of Morehead State University. Thirteen species of jelly lichens were documented in the park including several rare/uncommon species such as Scytinium apalachense, Collema pustulatum, and Lathagrium fuscovirens. This work was supported by a Morehead State University Undergraduate Research Fellowship and a travel grant from the Department of Biology and Chemistry at Morehead State University.

Project Dissemination: Jams, Jellies, and Jelly Lichens of Carter Caves State Resort Park, Carter County, Kentucky. Fitzpatrick, J. and A. C. Risk. 2024. Celebration of Student Scholarship, Morehead State University, Morehead, KY.

Awards and/or Honors: N/A

Post-Graduation Plans (Seniors Only): Begin the 4+1 Master's program in biology at MSU.

Frisby, Aliya

Major: Biology

Faculty Mentor: Allen Risk

Research/Project Title: Lichens of Carter Caves State Resort Park, Carter County, Kentucky

Project Abstract/Summary: Lichens are a complex symbiosis made of two components: a fungus and an organism capable of producing food, either green algae or cyanobacteria. Lichens are a vital part of forest ecosystems; those containing cyanobacteria are able to convert nitrogen in the atmosphere into usable nitrogen compounds for plants in the surrounding area. They are one of the first pioneers in a new environment, able to colonize rocks, soil, bark, and wood. The primary objective of this study was to make progress on a lichen species inventory for Carter Caves State Resort Park through field work and examination of previous collections housed in the herbarium of Morehead State University. One hundred seventy species of lichens were documented for the park comprised by 72 crustose, 72 foliose, and 26 fruticose species. Rare/uncommon lichens documented included Thyrea confusa, Scytinium apalachense, Bilimbia fuscoviridis, Circinaria contorta, and Pseudosagedia rhaphidosperma. This work was supported by a Morehead State University Undergraduate Research Fellowship and a travel grant from the Department of Biology and Chemistry at Morehead State University.

Project Dissemination: Lichens of Carter Caves State Resort Park, Carter County, Kentucky. Frisby, A. and A. C. Risk. 2024. Celebration of Student Scholarship, Morehead State University, Morehead, KY.

Awards and/or Honors: N/A

Post-Graduation Plans (Seniors Only): Begin the 4+1 Master's program in biology at MSU.

Hoard, Lily

Major: Biomedical Sciences
Faculty Mentor: Janelle Hare
Research/Project Title: Investigating cell division defects of Acinetobacter baumannii
Project Abstract/Summary: The pair of regulators, UmuDAb and DdrR, control transcription in the opportunistic pathogen, Acinetobacter baumannii. However, recent pilot data obtained in our lab suggests that DdrR may also interact with additional proteins such as those involved in control of cell division. These phenotypes involve the length of cells and the rate of growth of cells. Therefore, we will examine these parameters in the presence and absence of DdrR. Ms Hoard learned how to grow bacteria and prepare them in controlled concentrations for use in her assays. These assays involved depositing calibrated cultures into a 96-well plate and using a newly acquired shaking incubating microplate reader to evaluate the growth of different strains as well as under different DNA damaging or protein expressing conditions. She also learned how to make quality graphs presenting her data.She found that the growth rate of the double umuDAb-ddrR mutant strain DC8 was slower than not only wild-type cells, but either of the single umuDAb or ddrR mutant strains. She also learned how to prepare and stain microscopy slides, obtain micrographs and use the computer programs ImageJ and MicrobeJ to measure the lengths of cells. In these experiments she learned that the umuDAb mutant had a longer cell length than not only the wild type cells, but the ddrR or double umuDAb-ddrR mutant strain DC8.
Project Dissemination: N/A
Awards and/or Honors: N/A
Post-Graduation Plans (Seniors Only): N/A

Martin, McKinnley

Major: Biomedical Sciences
Faculty Mentor: Janelle Hare
Research/Project Title: Investigating cell division defects of Acinetobacter baumannii
Project Abstract/Summary: The pair of regulators, UmuDAb and DdrR, control transcription in the opportunistic pathogen, Acinetobacter baumannii. However, recent pilot data obtained in our lab suggests that DdrR may also interact with additional proteins such as those involved in control of cell division. These phenotypes involve the length of cells and the rate of growth of cells. Therefore, we will examine these parameters in the presence and absence of DdrR. These include growing cells in the presence and absence of DdrR as well as DNA damage, and measuring the lengths of cells as compared to wildtype strains. This will involve bacteriology, microscopy, and image analysis with Microbe J. Another type of experiment will use the newly acquired Epoch shaking incubating microplate reader to measure the rate of cell growth under these same conditions. Ms Martin learned how to grow cells under different relevant conditions, prepare and stain microscopy slides, obtain micrographs and use the computer programs ImageJ and MicrobeJ to measure the lengths of cells. She also learned how to make quality graphs presenting her data. We found that the untranslated region upstream of ddrR plays a role in restoring cell length after ddrR mutation.
Project Dissemination: N/A
Awards and/or Honors: N/A
Post-Graduation Plans (Seniors Only): N/A

Mays, Heavenly

Major: Biology & Chemistry
Faculty Mentor: Geoff Gearner
Research/Project Title: Bacteriological Assessment of the Triplett Creek Watershed
Project Abstract/Summary: The objectives of this project were (1) to assess and compare the density of polluting bacteria in 14 different sample sites in the Triplett Creek Watershed, Rowan County, Kentucky, and (2) to assess bacteria collected from the watershed for genes that encode antimicrobial resistance factors. Samples were collected on six different occasions from 14 established watershed sampling sites from August to October 2023, then analyzed for the occurrence and density of total coliform bacteria and the bacterium Escherichia coli. The data was then compared to data collected in 2009. In the Fall of 2009,

five sites exceeded the Kentucky Division of Water's limit of the geometric mean of 130 E. coli CFU/100 mL for streams designated for primary contact recreation [BB-0.23 (130.2), CC-0.37 (176.1), DC-0.27 (136.3), and TC-0.74 (180.2)]. In the Fall of 2023, two sites exceeded that limit [TC-0.74 (136.1) and TC-14.99 (135.2)]. These data suggest that there has been a reduction in E. coli loads in the watershed since 2009. To address the second objective, DNA was extracted from enriched cultures of bacteria collected from the ten watershed sampling sites. After assessment for quantity and purity, the isolated DNA was used as a target for polymerase chain reaction (PCR) employing oligonucleotide primers directed to two bacterial genetic markers and nine different antimicrobial resistance genes. All PCR products were analyzed by agarose gel electrophoresis. The results showed that three sites were positive for bacterial DNA associated with human fecal contamination. Genes for sulfonamide, erythromycin, and macrolide resistance were present in ten sites; and six sites were positive for a tetracycline resistance gene.

Project Dissemination:

Morgan E, Mays H, Gearner GW. 2024. Triplett Creek Watershed: Comparison Between 2009 and 2023 Escherichia coli and Coliform Bacteria Levels. Celebration of Student Scholarship, Morehead State University, Morehead, KY, 17 April 2024.

Awards and/or Honors: N/A

Post-Graduation Plans (Seniors Only): N/A

McFarland, Jack

Major: Pre Veterinary Sciences

Faculty Mentor: Smita Joshi

Research/Project Title: Interaction Effects of Bioactive Compounds In Thrombosis Therapy

Project Abstract/Summary: Occlusive thrombosis, a leading cause of global morbidity and mortality, claims the lives of 1 in 4 individuals. Developing novel antithrombotic treatments is crucial, as conventional antiplatelet drugs, despite their potency, have limitations like increased bleeding risk. Natural bioactive compounds offer a promising alternative due to their safety, efficacy, and affordability. This research project aims to identify and investigate the interaction effects of bioactive compound combinations in modulating thrombosis therapy.

This project hypothesizes that precise combinations of bioactive compounds such as garlic (allicin), ginger (gingerols), ginkgo biloba (flavonoids and terpene lactones), and turmeric (curcumin) can exert synergistic antithrombotic effects. These compounds, selected based on their historical use in cardiovascular health and demonstrated antiplatelet properties, have shown individual effects on platelet activity. However, the potential for synergistic effects in combination remains unexplored. The specific aims are:

Evaluate the efficacy of bioactive compound combinations in synergistically inhibiting platelet aggregation in vitro and preventing thrombosis in vivo.

Delineate the molecular mechanisms underlying the effects of these combinations on platelet biology.

Assess the safety and tolerability of these combinations.

Standardized bioactive compound extracts will be used in in vitro experiments such as platelet aggregation assays and Western blotting. In vivo investigations will involve a $FeCl_3$-induced carotid injury model. Safety assessments will encompass acute and chronic toxicity studies. All data will be analyzed using appropriate statistical tests. We anticipate identifying several combinations with antithrombotic properties. Our mechanistic studies will not only validate their clinical potential but will also provide valuable insights into platelet biology and function.

Project Dissemination:

Gibson, C., McFarland, J., Whiteheart, S. W., and Joshi, S. (2024, March). "Vesicle-Associated Membrane Proteins/VAMPs Regulate Platelet Cargo Levels". KY INBRE Annual Conference, Lexington, KY. Poster Presentation

McFarland J., and Joshi, S. (2024, April). "Interaction Effects of Bioactive Compounds in Thrombosis Therapy". Celebration of Student Scholarship Student Talk

Awards and/or Honors: Certificate of Merit award at the annual Celebration of Student Scholarship symposium at Morehead State University

Post-Graduation Plans (Seniors Only): Planning to apply for veterinary science programs.

Morgan, Emily

Major: Biology & Chemistry

Faculty Mentor: Geoff Gearner

Research/Project Title: Bacteriological Assessment of the Triplett Creek Watershed

Project Abstract/Summary: The objectives of this project were (1) to assess and compare the density of polluting bacteria in 14 different sample sites in the Triplett Creek Watershed, Rowan County, Kentucky, and (2) to assess bacteria collected from the watershed for genes that encode antimicrobial resistance factors. Samples were collected on six different occasions from 14 established watershed sampling sites from August to October 2023, then analyzed for the occurrence and density of total coliform bacteria and the bacterium Escherichia coli. The data was then compared to data collected in 2009. In the Fall of 2009, five sites exceeded the Kentucky Division of Water's limit of the geometric mean of 130 E. coli CFU/100 mL for streams designated for primary contact recreation [BB-0.23 (130.2), CC-0.37 (176.1), DC-0.27 (136.3), and TC-0.74 (180.2)]. In the Fall of 2023, two sites exceeded that limit [TC-0.74 (136.1) and TC-14.99 (135.2)]. These data suggest that there has been a reduction in E. coli loads in the watershed since 2009. To address the second objective, DNA was extracted from enriched cultures of bacteria collected from the ten watershed sampling sites. After assessment for quantity and purity, the isolated DNA was used as a target for polymerase chain reaction (PCR) employing oligonucleotide primers directed to two bacterial genetic markers and nine different antimicrobial resistance genes. All PCR products were analyzed by agarose gel electrophoresis. The results showed that three sites were positive for bacterial DNA associated with human fecal contamination. Genes for sulfonamide, erythromycin, and macrolide resistance were present in ten sites; and six sites were positive for a tetracycline resistance gene.

Project Dissemination:

Morgan E, Mays H, Gearner GW. 2024. Triplett Creek Watershed: Comparison Between 2009 and 2023 Escherichia coli and Coliform Bacteria Levels. Celebration of Student Scholarship, Morehead State University, Morehead, KY, 17 April 2024.

Awards and/or Honors: N/A

Post-Graduation Plans (Seniors Only): N/A

Newsome, Ethan

Major: Biomedical Sciences/Legal Studies

Faculty Mentor: Janelle Hare

Research/Project Title: Identification of DdrR-interacting proteins with two-hybrid system assays

Project Abstract/Summary: This project's goal is to determine if DdrR and UmuDAb directly interact with components of the divisome, by which they might control the cell division checkpoint. Our rationale is that other cell division inhibitors bind to divisome proteins, such as SulA binding to FtsZ, or the small CDIs that bind to FtsW or FtsI. Our rationale derives from the observations that two independent ddrR mutants also show defects in growth, plus after DNA damage (Fig W). But it is a small molecule similar to gp7 that in other organisms, binds to another protein (LexA). So maybe it can also bind to the protein FtsZ, and affect its actions to work its cell-division related phenotype. Our hypothesis is that the phenotype of cell division inhibition shown by ddrR mutants is the result of direct interaction between DdrR and one of the divisome components. The approach we will take is the bacterial two-hybrid system, which we previously used to demonstrate UmuDAb and DdrR homodimerization, to test whether DdrR interacts with omponents of the divisome, as two-hybrid screens and selections have often been used to study divisome protein interactions. Mr Newsom made and screened a library of random pieces of A. baumannii DNA with the BACTH method for interactions with DdrR. He identified and characterized one protein, KZA74_19365, that is being investigated further.

Project Dissemination:

Newsom, E., D. Cook, and J. M. Hare. 2024. Characterizing Interaction Domains between DdrR and KZA74_19365. Poster, American Society for Microbiology KY-TN Branch Meeting, Lexington, KY.

Newsom, E., Cook, D., and J. M. Hare. 2023. Identifying DdrR-interacting proteins with two-hybrid system assays. Poster, American Society for Microbiology KY-TN Branch Meeting, Cookeville,

TN and the Kentucky Academy of Sciences General Meeting

Awards and/or Honors: Newsom, Ethan. 2023. Thoroughbred Award, Kentucky Academy of Sciences Meeting Poster Presentation

Post-Graduation Plans (Seniors Only): N/A

Senters, Caitlyn

Major: Biology

Faculty Mentor: David Eisenhour

Research/Project Title: Life-history of the Popeye Shiner, Notropis ariommus, and the Highland Shiner, Notropis micropteryx, in the Rockcastle River, Kentucky.

Project Abstract/Summary: For two minnow species with unstudied life-history, the Popeye Shiner and the Highland Shiner, we will document two aspects of their life history: (1) age and growth and (2) reproductive cycle. Specimens will be from a population in the Rockcastle River, and include previously-collected specimens, and new specimens collected on a monthly basis, as flow conditions permit. Age and growth will be documented by length-frequency analysis, supplemented by examinations of scale annuli. Reproductive cycle will be documented by size and conditions of gonads, especially using a gonadosomatic index.

We have collected data from over 500 captured, preserved specimens, in addition to some length-frequency data from over 1000 released specimens. We have documented that these fishes live to a maximum or 2-3 years and are reproductively mature by 12 or 24 months of age. Gonad sizes are high from April to early June, but then rapidly decline after that, indicating a spawning season from about late April to very early June.

The results collected help managers of biodiversity protect these fishes and other aquatic resources. For example, this suggests the most sensitive time (reproduction) occurs in late Spring and major disturbances to streams (e.g., replacing a bridge) should not be done at this time.

Project Dissemination:

2023. Black, S., J. Vise, Z. Baker, C. Senters, and D. J. Eisenhour. Life history of a minnow: growth and reproduction of the Popeye Shiner (Notropis ariommus) in the Rockcastle River, Kentucky. Kentucky Academy of Science, Northern Kentucky University, November and Southeastern Fishes Council, November.

2023. Baker, Z., C. Senters, S. Black, J. Vise, and D. J. Eisenhour. Age, growth, and reproductive cycle of the Highland Shiner (Notropis micropteryx) in Rockcastle River, Kentucky. Kentucky Academy of Science, Northern Kentucky University, November and Southeastern Fishes Council, November.

2024. Baker, Z. C. Senters, and D. J. Eisenhour. Reproductive cycle of the Highland Shiner (Notropis micropteryx) in Rockcastle County, Kentucky. Celebration of Student Scholarship, Morehead State University (April, poster).

2024. Senters, C., Z. Baker, and D. J. Eisenhour. Age and growth of the Highland Shiner (Notropis micropteryx) in Rockcastle County, Kentucky. Celebration of Student Scholarship, Morehead State University (April, poster).

Awards and/or Honors: At KAS, Both posters were given highest award – "Thoroughbred"

At CSS, Caitlyn was the presenter on a poster that was awared "highest merit".

Post-Graduation Plans (Seniors Only): Caitlyn is a junior with more more year at MSU. She has been doing medical internships and is tentatively planning to go into that direction post graduation. She will continue doing fish research with me for the next year (2024-2025).

Simpson, Alyson

Major: Biomedical Science

Faculty Mentor: Allen Risk

Research/Project Title: Thin-layer Chromatography of Dust Lichens (Lepraria) of Carter Caves State Resort Park

Project Abstract/Summary: When it comes to identifying dust lichens belonging to the genus Lepraria, to identify them based only on morphology proves to be difficult. However, thin-layer chromatography (TLC) has been used by previous researchers to identify compounds found within the Lepraria thallus which

helped with the identification of samples. During the past year, TLC was employed within the Morehead State University (MSU) herbarium in order to identify Lepraria specimens from Carter Caves State Resort Park. The samples of the lichens were saturated in acetone and spotted onto a silica gel plate. The lower portion of the plate was then placed into a solvent system containing 20 mL toluene and 3 mL glacial acetic acid. TLC utilizes compound polarities and their different migration speeds to spread the compounds throughout the plate. The plates were then evaluated for several characteristics including Rf values, response to long and short-wave UV, hydrophobic spots, and compound colors in response to sulfuric acid exposure. The identification of each compound found within a sample then allowed for the identification of the species of Lepraria. This research was supported by a Morehead State University Undergraduate Research Fellowship and travel and supply grants from the Department of Biology and Chemistry.
Project Dissemination: Using Thin-Layer Chromatography to Identify Lepraria Lichens. Simpson, A. and A. C. Risk. 2024. Celebration of Student Scholarship, Morehead State University, Morehead, KY.
Awards and/or Honors: N/A
Post-Graduation Plans (Seniors Only): Begin the 4+1 Master's program in biology at MSU.

Smallwood, Liberty

Major: Biomedical Sciences
Faculty Mentor: Jen O'Keefe
Research/Project Title: FiaWW: Fungi in a Warmer World
Project Abstract/Summary: The Fungi in a Warmer World Project (FiaWW) hires skilled undergraduates as URFs to be research team members and to conduct laboratory analysis of fungal constituents of sediment samples from global sources which are then used to reconstruct climate space shifts and ecosystem changes through a 5 million year period of earth history. Resulting data is then fed into a database being developed to model future fungal assemblage behaviors. Students are responsible for sample processing, data collection, data analysis, and dissemination of project results, as well as dissemination, and general laboratory maintenance and housekeeping. The focus in Fall 2023 is completion of analyses of materials from Peru and additional sites as time permits. The bulk of work on P6 and other western Peruvian sites was completed by January 2024; work on the Amazonas region began in late January 2024 and is nearing completion. Completion is expected by the end of the semester.
Project Dissemination:

Cabrera, J., Marsh, C., Smallwood, L., VanderEpst, O., Romero, I., Nuñez Otaño, N., Ochoa, D., O'Keefe, J., 2023. Fungal Palynology of early-middle Miocene sediments from Northwestern Peru. Lexington 2023: A Joint Meeting of the 55th Annual Meeting of AASP - The Palynological Society and Meeting of the CIMP - Commission Internationale de la Microflore du Paléozoïque Subcommissions. Program with Abstracts, p. 14.

Pound, M.J., O'Keefe, J.M.K., Gibson, M., Romero, I., Nuñez Otaño, N., Warny, S., McCoy, S., McCoy, J., Pilié, M., Alden, M.E., Jones, S., Lennex-Stone, J.E., Marsh, C.A., Morgan, R., Nkau, I., Patel, A.A., Spears, T.M., Tarlton, L., Smallwood, L.F., Todd, C., VanderEspt, L.O., Webber, K., Eble, C.F., Rember, W.C., Starnes, J., Alford, M.H., Brink, A., Belkin, H., 2023. Fungi in a Warmer World: Middle Miocene fungi and global palaeoclimates. Lexington 2023: A Joint Meeting of the 55th Annual Meeting of AASP - The Palynological Society and Meeting of the CIMP Commission Internationale de la Microflore du Paléozoïque Subcommissions. Program with Abstracts, p. 37.

Cabrera, J., Marsh, C., VanderEpst, L.O., Smallwood, L.F., Romero, I., Nuñez Otaño, N., Ochoa, D., O'Keefe, J., 2023., Fungal Assemblages Change with Depositional Environment and Impact Paleoclimate Reconstructions: a case study from the Miocene of NW Peru. Annual Meeting of the Geological Society of America, Pittsburgh, PA. Geological Society of America Abstracts with Programs, 55(6), https://doi.org/10.1130/abs/2023AM-395088

Smallwood, L., VanderEspt, L.O., Marsh, C., Montenegro, J.-F., Ochoa, D., Pound, M.J., O'Keefe, J., 2024. MIOCENE FUNGI FROM THE AMAZONAS REGION OF PERU: PRELIMINARY PALEOCLIMATIC AND PALEOECOLOGICAL RECONSTRUCTIONS. https://gsa.confex.com/gsa/2024SE/meetingapp.cgi/Paper/398397

Smallwood, L., VanderEspt, L.O., Marsh, C., Montenegro, J.-F., Ochoa, D., Pound, M.J., O'Keefe, J., 2024. MIOCENE FUNGI FROM THE AMAZONAS REGION OF PERU: PRELIMINARY PALEOCLIMATIC AND PALEOECOLOGICAL RECONSTRUCTIONS. 2024 Morehead State Celebration of Student Scholarship, Abstracts, 42.

Awards and/or Honors: Exceptional Merit – Oral Presentation – 2024 Celebration of Student Scholarship

Post-Graduation Plans (Seniors Only): Liberty's goal is acceptance into medical school, but she may opt to work for a year first.

Strait, Zachary

Major: Geology

Faculty Mentor: Jen O'Keefe

Research/Project Title: Museum Science in the Geosciences: Curation of Fossils, Minerals, and Rocks

Project Abstract/Summary: This project will generate first order curatorial data, identify physical storage and organization needs to appropriately archive specimens, and provide the framework for development of a collections improvement proposal to be submitted to a funding agency. The Geology program has substantial fossil, mineral, and rock holdings that represent nearly 80 years of collections and research by faculty and students. It was well curated prior to the 1995 move ahead of construction of the C-wing and renovation of the A-wing of Lappin Hall, but has not been curated in the past 27 years. Indeed, the majority of exisiting collections were not unpacked and re-organized following the move. Simultaneously, significant additions were made to the collections, resulting in a morass of materials that filled two laboratory spaces and the A-Wing attic. In Spring 2020, two student employees were tasked with and completed digitization of the existing card catalog of specimens. We are now moving into phase 2 of this project, which involves initial training in curation of fossil collections following guidance by White and Allmon (2000) and in mineral and rock collections following the guidance of Brunton et al. (1995) and Rose and Tores (1992) and following recommendations by Royce and Baars (2021). Phase 2 is two-pronged: determining which of the original collections are intact (cross-referencing with the original, now digital catalog), and assessing the state of current collections in terms of specimen stability (i.e., has it decayed beyond the point of stabilization due to improper storage or can it be stabilized through proper storage and identification of which materials will be needed to do so; if overly decayed, specimens will be disposed of) and archival character (i.e., how much data do we have on individual, uncatalogued specimens, and if none, assessing whether the specimen should be retained for teaching purposes or discarded). The end goals of this phase of the project are to 1) update the nascent curatorial database with actual holdings; 2) identify specimen storage needs (from bag and unit tray sizes to microclimate considerations to storage cabinet space needed to house materials); 3) determine a unified organizational theme for each specimen type; and 4) train students in geoscience collections management. Together, these goals lay the foundation for application for a collections improvement grant in collaboration with other natural science collections in Lappin Hall ahead of construction of the new science and engineering building.

Zach has focused on tasks 2, 3, and 4 during 2023-2024. This has resulted in the eviction of a significant number of specimens from the collections (no data, not of value for teaching), consolidation of existing holdings (there is not need four three stockpiles of calcite, for example), and improved storage for climatically sensitive samples (in zip bags with desiccant). He has successfully trained two new students in his tasks, leaving the project in good hands next semester.

Project Dissemination:

Terry, M., Gregory, C., Laiben, O., Strait, Z., O'Keefe, J., 2024. GEOSCIENCE ARCHIVISM – SAVING MOREHEAD STATE'S COLLECTIONS ONE ROCK AT A TIME. https://gsa.confex.com/gsa/2024SE/meetingapp.cgi/Paper/398371

Terry, M., Turner, S., Strait, Z., Elmore, H., O'Keefe, J., 2024. Geoscience Archivism – Saving Morehead State's collections one rock at at a time. Morehead State University Celebration of Student Scholarship Program with Abstracts, p. 69.

Awards and/or Honors: N/A

Post-Graduation Plans (Seniors Only): His goal is employment as an entry-level geoscientist.

VanderEspt, L.O. "Ollie"

Major: Pre-Veterinary

Faculty Mentor: Jen O'Keefe

Research/Project Title: FiaWW: Fungi in a Warmer World

Project Abstract/Summary: The Fungi in a Warmer World Project (FiaWW) hires skilled undergraduates as URFs to be research team members and to conduct laboratory analysis of fungal constituents of sediment samples from global sources which are then used to reconstruct climate space shifts and ecosystem changes through a 5 million year period of earth history. Resulting data is then fed into a database being developed to model future fungal assemblage behaviors. Students are responsible for sample processing, data collection, data analysis, and dissemination of project results, as well as dissemination, and general laboratory maintenance and housekeeping. The focus in Fall 2023 is completion of analyses of materials from Peru and additional sites as time permits. The bulk of work on P6 and other western Peruvian sites was completed by January 2024; work on the Amazonas region began in late January 2024 and is nearing completion. Completion is expected by the end of the semester.

Project Dissemination:

Cabrera, J., Marsh, C., Smallwood, L., VanderEpst, O., Romero, I., Nuñez Otaño, N., Ochoa, D., O'Keefe, J., 2023. Fungal Palynology of early-middle Miocene sediments from Northwestern Peru. Lexington 2023: A Joint Meeting of the 55th Annual Meeting of AASP - The Palynological Society and Meeting of the CIMP - Commission Internationale de la Microflore du Paléozoïque Subcommissions. Program with Abstracts, p. 14.

Pound, M.J., O'Keefe, J.M.K., Gibson, M., Romero, I., Nuñez Otaño, N., Warny, S., McCoy, S., McCoy, J., Pilié, M., Alden, M.E., Jones, S., Lennex-Stone, J.E., Marsh, C.A., Morgan, R., Nkau, I., Patel, A.A., Spears, T.M., Tarlton, L., Smallwood, L.F., Todd, C., VanderEspt, L.O., Webber, K., Eble, C.F., Rember, W.C., Starnes, J., Alford, M.H., Brink, A., Belkin, H., 2023. Fungi in a Warmer World: Middle Miocene fungi and global palaeoclimates. Lexington 2023: A Joint Meeting of the 55th Annual Meeting of AASP - The Palynological Society and Meeting of the CIMP Commission Internationale de la Microflore du Paléozoïque Subcommissions. Program with Abstracts, p. 37.

Cabrera, J., Marsh, C., VanderEpst, L.O., Smallwood, L.F., Romero, I., Nuñez Otaño, N., Ochoa, D., O'Keefe, J., 2023., Fungal Assemblages Change with Depositional Environment and Impact Paleoclimate Reconstructions: a case study from the Miocene of NW Peru. Annual Meeting of the Geological Society of America, Pittsburgh, PA. Geological Society of America Abstracts with Programs, 55(6), https://doi.org/10.1130/abs/2023AM-395088

Smallwood, L., VanderEspt, L.O., Marsh, C., Montenegro, J.-F., Ochoa, D., Pound, M.J., O'Keefe, J., 2024. MIOCENE FUNGI FROM THE AMAZONAS REGION OF PERU: PRELIMINARY PALEOCLIMATIC AND PALEOECOLOGICAL RECONSTRUCTIONS. https://gsa.confex.com/gsa/2024SE/meetingapp.cgi/Paper/398397

Smallwood, L., VanderEspt, L.O., Marsh, C., Montenegro, J.-F., Ochoa, D., Pound, M.J., O'Keefe, J., 2024. MIOCENE FUNGI FROM THE AMAZONAS REGION OF PERU: PRELIMINARY PALEOCLIMATIC AND PALEOECOLOGICAL RECONSTRUCTIONS. 2024 Morehead State Celebration of Student Scholarship, Abstracts, 42.

Awards and/or Honors: Exceptional Merit – Oral Presentation – 2024 Celebration of Student Scholarship

Post-Graduation Plans (Seniors Only): Ollie's goal is acceptance into veterinary school, although she may work for a year first.

Vise, Jared

Major: Biology

Faculty Mentor: David Eisenhour

Research/Project Title: Life-history of the Popeye Shiner, Notropis ariommus, and the Highland Shiner, Notropis micropteryx, in the Rockcastle River, Kentucky.

Project Abstract/Summary: For two minnow species with unstudied life-history, the Popeye Shiner and the Highland Shiner, we will document two aspects of their life history: (1) age and growth and (2)

reproductive cycle. Specimens will be from a population in the Rockcastle River, and include previously-collected specimens, and new specimens collected on a monthly basis, as flow conditions permit. Age and growth will be documented by length-frequency analysis, supplemented by examinations of scale annuli. Reproductive cycle will be documented by size and conditions of gonads, especially using a gonadosomatic index.

We have collected data from over 500 captured, preserved specimens, in addition to some length-frequency data from over 1000 released specimens. We have documented that these fishes live to a maximum or 2-3 years and are reproductively mature by 12 or 24 months of age. Gonad sizes are high from April to early June, but then rapidly decline after that, indicating a spawning season from about late April to very early June.

The results collected help managers of biodiversity protect these fishes and other aquatic resources. For example, this suggests the most sensitive time (reproduction) occurs in late Spring and major disturbances to streams (e.g., replacing a bridge) should not be done at this time.

Project Dissemination:

2023. Black, S., J. Vise, Z. Baker, C. Senters, and D. J. Eisenhour. Life history of a minnow: growth and reproduction of the Popeye Shiner (Notropis ariommus) in the Rockcastle River, Kentucky. Kentucky Academy of Science, Northern Kentucky University, November and Southeastern Fishes Council, November.

2023. Baker, Z., C. Senters, S. Black, J. Vise, and D. J. Eisenhour. Age, growth, and reproductive cycle of the Highland Shiner (Notropis micropteryx) in Rockcastle River, Kentucky. Kentucky Academy of Science, Northern Kentucky University, November and Southeastern Fishes Council, November.

2024. Baker, Z. C. Senters, and D. J. Eisenhour. Reproductive cycle of the Highland Shiner (Notropis micropteryx) in Rockcastle County, Kentucky. Celebration of Student Scholarship, Morehead State University (April, poster).

2024. Senters, C., Z. Baker, and D. J. Eisenhour. Age and growth of the Highland Shiner (Notropis micropteryx) in Rockcastle County, Kentucky. Celebration of Student Scholarship, Morehead State University (April, poster).

Awards and/or Honors: At KAS, Both posters were given highest award – "Thoroughbred"

Post-Graduation Plans (Seniors Only): In the fall Jared is planning to start as a Master's student in Biology at Morehed, via the dual undergraduate/graduate 5-year program.

Wallace, Amelia

Major: Biology

Faculty Mentor: Ignacio Birriel

Research/Project Title: Using a Multichannel Spectrometer to Measurement of the Mass Attenuation Coefficient of Medical Gels #3 and #4 by Humimic Medical

Project Abstract/Summary: Humimic Medical offers six different grades of medical gel. Gelatin #3, density of 856.8 kg/m3 and a Young's Modulus of 1.9 x 105 Pa, is commonly used to simulate uterus tissue. Gelatin #4, density of 934.6 kg/m3 and a Young's Modulus of 1.5 x 105 Pa, is commonly used to simulate breast and intestinal tissue. In this study we exposed both gels to gamma rays, ranging from 0.09 MeV to 1.33 MeV using common radioactive sources found in nuclear physics labs and calculate their mass attenuation coefficients. Sources used for this experiment were Cadmium-109, Cesium-137, Cobalt-57 and Cobalt-60.

Project Dissemination: N/A

Awards and/or Honors: N/A

Post-Graduation Plans (Seniors Only): N/A

Engineering Sciences

Cook, Hunter

Major: Electrical Engineering Technology

Faculty Mentor: Tathagata Ray

Research/Project Title: Mitigation of wind load on building roofs

Project Abstract/Summary: We conducted experiments on a 1:6 scaled model of the Texas Tech University's (TTU's) Wind Engineering Research Field Laboratory's 30′ x 45′ x 13′(height) test structure at the Florida International University's (FIU's) Wall of Wind (WOW). We retrofitted two adjacent edges of the roof with controllers of height 2″ (per 1:6 geometric length scale). The Woodworking Tool Connection, a wood workshop at Morehead, KY, fabricated these controllers. This test aimed to measure how much this controller can reduce wind-induced suction and wind velocity over the roof. The tests were performed with a wind speed of 40 mph (at mean roof height) in full-scale with open terrain exposure. Wind directions were considered from the west edge to the north edge. Ninety-eight (most dense) pressure taps were placed in the quadrant (30″ x 40″ area). Ten surface velocity sensors were also mounted in this quadrant in a 15″ x 15″ region. It was observed that the controller reduces suction from 80% (at higher suction regions) to 20% (at lower suction regions) in most of the regions. It was further observed that the controller reduces speeds from 40% to 10% in most of the regions. These preliminary findings encourage us to investigate the aerodynamics of the sloped roofs of non-rectangular buildings with and without the controllers. Another point of the investigation will be to determine the optimum height of the controllers that can mitigate roof damage at a reasonable cost.
Project Dissemination: A proposal is submitted to NSF based on this research: Comprehensive wind-induced roof load determination and damage mitigation by a wind-activated passive controller
PI: Tathagata Ray
Co-PI: Rachel Rogers (MSU), Arindam Chowdhury (Florida Int University)
Awards and/or Honors:
Post-Graduation Plans (Seniors Only): N/A

Fitch, Landon

Major: Computer Science
Faculty Mentor: Kouroush Jenab
Research/Project Title: Enabling Smart Agriculture with Computer Vision
Project Abstract/Summary: This research project focuses on the development of a computer vision application to detect diseases in four of Kentucky's most commonly exported crops: soybeans, corn, wheat, and tobacco. Using the state-of-the-art YOLOv8 object detection algorithm, we aim to create a robust and versatile tool for disease detection and classification. To facilitate this, we curated and annotated a comprehensive image dataset composed of various disease states and healthy samples for each crop. Our long-term objective is to adapt this application for deployment on drones, which can fly over farms, capturing images and enabling rapid and widespread disease detection, offering farmers the opportunity to respond promptly to potential threats. This research represents a significant contribution to precision agriculture and crop management, addressing the need for efficient disease detection methods in a rapidly evolving agricultural landscape. The integration of computer vision and drone technology has the potential to revolutionize crop monitoring, improve yield predictions, and enhance overall farm productivity, thereby ensuring food security and economic sustainability in Kentucky and beyond.
Project Dissemination: Poster Presentations:
Fitch, Landon; Ward, Tyler; Jenab, Kouroush; and Ortega-Moody, Jorge (2024, April). Enabling Smart Agriculture with Computer Vision, poster, Celebration of Student Scholarship, Morehead, KY, April, 2024.
Fitch, Landon; Ward, Tyler; Jenab, Kouroush; and Ortega-Moody, Jorge (2024, April). Enabling Smart Agriculture with Computer Vision, poster, Posters at the Capitol, Frankfort, KY, March, 2024.
Oral Presentation:
Fitch, Landon; Ward, Tyler; Jenab, Kouroush; and Ortega-Moody, Jorge (2024, April). Enabling Smart Agriculture with Computer Vision, oral, Posters at the Capitol, Frankfort, KY, March, 2024.
Awards and/or Honors: Selected as MSU's representative for the Lighting Talk at the 2004 Posters-at-the-Capitol event.
Post-Graduation Plans (Seniors Only): Student will continue at MSU after his graduation with his B.S. degree in the fall. He will be pursing an M.S. degree in Engineering & Technology Management.

Fredrico, Gianna

Major: Physics
Faculty Mentor: Jennifer Birriel
Research/Project Title: The Blazhko Effect in RR Lyrae Star
Project Abstract/Summary: Pulsating variable stars are stars that physically grow and shrink, causing them to periodically change in brightness in the night sky. In most cases, this change occurs very regularly, however some stars exhibit the Blazhko Effect (BE), which causes a gradual increase and decrease in the magnitude and time between brightness peaks. In some stars, this gradual change can itself vary in period and amplitude, which is known as a modulated BE. The cause of the BE is unknown. This research project aims to identify stars with a modulated BE, which may provide clues into its cause. We used the Weighted Wavelet-Z (WWZ) analysis to detect changes in the frequency and amplitude of the brightnesses of stars observed by NASA's Transiting Exoplanet Survey Satellite (TESS). The WWZ analysis has been scarcely utilized in this specific area of variable star research, and this project shows its usefulness in identifying changes in frequency and amplitude for stars with limited data sets.
Project Dissemination: Annual Celebration of Student Scholarship
Awards and/or Honors: N/A
Post-Graduation Plans (Seniors Only): N/A

Galante, Wesley
Major: Computer Science
Faculty Mentor: Heba Elgazzar
Research/Project Title: Image and Video Sequence Recognition
Project Abstract/Summary: Driving is the primary means of transportation for many people around the world. Whether the use is to assist human drivers or create autonomous driving, the use of machine learning can create safer road conditions. Drivers must consider other objects on the road, most commonly other vehicles, and pedestrians. These three components, road signs, pedestrians, and vehicles make up a large majority of objects that a driver will encounter when on the road. This research applies machine learning algorithms, specifically Convolutional Neural Networks (CNN), to classify these road objects. The goal is to create a classification model that can reliably classify road objects and classify the different road signs into individual classes. The results showed high accuracy in classifying the objects, even at lower resolutions and poor conditions.
Project Dissemination: Presenting at ACM MSU students' chapter. The student is working on publishing a conference paper
Awards and/or Honors: N/A
Post-Graduation Plans (Seniors Only): N/A

Hall, Tyler
Major: Computer Science
Faculty Mentor: Anindita Paul
Research/Project Title: Green Energy-Based Bluetooth Low Energy Star Network for Internet of Things Applications
Project Abstract/Summary: Due to the advancement of low-power integrated circuit technology, the application of the Internet of Things (IoT) can be seen everywhere, from domestic life to the medical field to industrial applications. The IoT is a physical objects network embedded with sensors, software, electronics, and network connectivity, allowing objects to collect and exchange information. By 2030, it is estimated that there will be over 25 billion connected IoT devices globally. The power of IoT will be limitless if the IoT networks can be energy efficient. The use of Bluetooth Low Energy (BLE) can be a viable solution, as opposed to other wireless technologies like ZigBee, Bluetooth Classic, and Wi-Fi. BLE enables devices to connect to each other and exchange data with minimum energy consumption via UHF radio waves. Bluetooth Low Energy technology operates in the ISM frequency range from 2.400 GHz to 2.483 GHz. Forty channels spaced 2 MHz apart are allocated to BLE to enable devices to communicate. It is compatible with most major operating systems (iOS, Android, Windows, etc.), making it easy to develop applications that run on different platforms.

In our project, we designed a general-purpose star network using BLE that can be used in real-life applications, such as a) in the medical field to make smart hospital buildings, b) to ease Precision Agriculture, c) in city trash collection, d) managing inventory in a warehouse or in a supercenter store. The star topology has the advantage of simplicity and directness. Thus, it has the lowest latency compared to other networks like mesh networks and tree structure networks.
As proof of concept, the BLE star network was formed using multiple ESP 32 microcontrollers as peripheral nodes and cellphones as central nodes. The ultrasonic sensors were used with each microcontroller to determine an object and its distance. It can find the object and distance by sending out high-frequency sound waves and measuring how long it takes for the sound to bounce back to the sensor. Energy harvesters that can scavenge energy from the ambiance used to power the device. Using the energy-harvesting technique offers a solution to reducing battery waste and making the proposed device more sustainable. The solar panels used in this project had an output voltage between 5V and 6V. The 3.7V lithium battery was charged using two solar panels connected in parallel to generate more charging current. The TP4056 battery charger module was used between solar panels and the battery. This module was responsible for charging the battery and preventing overcharging. A low dropout voltage regulator circuit (MCP1700-3302E) was used to get 3.3V from the battery output. The output from the voltage regulator was used to power the ESP32 through the 3.3V pin.
Project Dissemination: Presented at Morehead State University's CELEBRATION OF STUDENT SCHOLARSHIP
Accepted in ATMAE 2024 National Conference for presentation
Awards and/or Honors: N/A
Post-Graduation Plans (Seniors Only): N/A

Hargesheimer, Ivan

Major: Physics
Faculty Mentor: Kevn Adkins
Research/Project Title: Studies of Statistical Precision of Jet Measurements with the ePIC detector
Project Abstract/Summary: In this project we use simulated collisions from the future electron ion collider (EIC) and reconstructed output data from the electron-proton Ion Collider (ePIC) detector. From the data we reconstruct jets of hadrons, which can be used to study the Collins asymmetry. This asymmetry provides deeper insight into the transverse spin structure of partons inside of the proton. Presently we are about to plot the output uncertainties on the Collins asymmetries, which provide a baseline check on the detector’s ability to fulfill the physics mission of the EIC.
Project Dissemination: Poster at the 2024 Annual Celebration of Student Scholarship
Awards and/or Honors: N/A
Post-Graduation Plans (Seniors Only): N/A

Hernandez, Ethan

Major: Engineering Technology
Faculty Mentor: Kouroush Jenab
Research/Project Title: Development of an Energy-Efficient Heat Exchange System
Project Abstract/Summary: In the pursuit of sustainable energy solutions, this engineering project aims to improve conventional heat exchange systems by introducing an innovative approach to harnessing exhaust heat generated by commercial drying machines. The primary objective is to develop an energy-efficient heat exchange system that redirects the otherwise wasted exhaust heat from these machines into residential heating systems. By capitalizing on this often-underutilized resource, the project aims to not only enhance the overall energy efficiency of the drying process but also contribute to home heating in an environmentally conscious manner. The proposed system involves the integration of a heat exchange mechanism designed to capture, transfer, and utilize the high-temperature exhaust produced during the drying cycle. Through careful engineering and thermal analysis, the project seeks to optimize the efficiency of heat transfer, ensuring that a significant portion of the exhaust heat is effectively channeled into residential spaces. This approach not only minimizes energy wastage but also offers a sustainable alternative for homeowners, potentially reducing their reliance on traditional heating sources. Key features

of the project include a robust heat exchanger design, intelligent control systems for seamless integration with drying machines, and a focus on user-friendly implementation. The anticipated outcome is a cost-effective system that contributes to a more sustainable and cost-effective heating solution for households.
Project Dissemination: Hernandez, Ethan; Ward, Tyler; Ortega-Moody, Jorge; and Jenab, Kouroush (2024, April). Development of an Energy-Efficient Heat Exchange System, poster, Celebration of Student Scholarship, Morehead, KY, April, 2024.
Awards and/or Honors: N/A
Post-Graduation Plans (Seniors Only): Now employed at STOBER.

Hensley, Dalton

Major: Computer Science
Faculty Mentor: Heba Elgazzar
Research/Project Title: A New Noval Programming Language for Software Development
Project Abstract/Summary: This research project aims to explore and implement a novel programming language. Spiral is a dynamically typed interpreted language that relies heavily on runtime diagnostics and error reporting. Our findings indicate that the usability of a programming language is greatly influenced by the quality of the errors it reports to the end user. Therefore, significant time and care have gone into handling subtle (and expected) mistakes often made by programmers. Spiral also supports a comprehensive collection of features typical in other languages: variables, selection, iteration, abstraction, and application. Our hope with Spiral is to build a language that facilitates rapid debugging, improves code quality, and enhances the end-user experience.
Project Dissemination: The project was presented in 2024 Posters at the capitol as well as an oral presentation at MSU Students Scholarship Celebration. We are in the process of publishing a journal paper.
Awards and/or Honors: Merit award from MSU Students Scholarship Celebration
Post-Graduation Plans (Seniors Only): N/A

Justice, Ryan

Major: Civil Engineering Technology
Faculty Mentor: Tathagata Ray
Research/Project Title: Testing of Multiple Floor Isolated Model Buildings Under Earthquake Conditions
Project Abstract/Summary: In the face of earthquakes, occupants of buildings are at risk of injury or death, even with the current gold standard for earthquake protection in place. This current gold standard is referred to as base isolation– this method separates the superstructure of a building from its foundation using isolators. This allows for the building to rock back and forth independently of the foundation. This is capable of protecting the building from structural damage, but damage to nonstructural components of the building is still very common. This can lead to grave injuries or even death to occupants, especially occupants of hospitals. In the event of an earthquake, equipment throughout a hospital is capable of rolling or sliding fast enough to break bones or to cause brain damage. The goal of our research is to investigate a new method of preventing both structural and nonstructural damage to buildings. This method is referred to as floor isolation. In addition to placing the isolators between the foundation and superstructure, they are also placed between each of the lateral load bearing elements of the building. We are researching this method using a shaker and various model buildings, including one small-scale model of our local hospital, St. Claire. The goal of this research is to determine if floor isolation decreases floor accelerations in model buildings.
Project Dissemination: R. Justice, H. Cook, T. Ray “Testing of Multiple Floor Isolated Model Buildings Under Earthquake Conditions” Celebration of Student Scholarship, Morehead, KY, April 2023
Awards and/or Honors: Merit Award 2023 Celebration of Student Scholarship
Post-Graduation Plans (Seniors Only): N/A

Lennex-Stone, Libby

Major: Geoscience
Faculty Mentor: Md Golam Kibria

Research/Project Title: Analyzing Spatial Relationships Between Long-Term Groundwater Monitoring Data and Climatic Data for Comprehensive Understandings

Project Abstract/Summary: Climate change introduces uncertainties in the dynamics of water resource supply and management. According to the Intergovernmental Panel on Climate Change (IPCC) assessments, the global mean surface temperature has risen by 0.6 ± 0.2 °C since 1861, and a further increase of 2 to 4 °C is projected within the next century. This temperature escalation has resulted in a gradual rise in surface temperatures and considerable variations in global precipitation patterns. The heightened variability in rainfall implies a potential for more frequent and extended periods of high and low groundwater levels. To investigate these phenomena, we gathered water table data from over 1000 wells in Kentucky spanning 40 years from 1980 to 2020. Additionally, historical climatic data, encompassing precipitation and temperature records from 1950 to the present, were incorporated into the analysis. Linear regression analyses were conducted on the groundwater levels for both wet and dry seasons. The spatial distribution of the data was visualized using ArcGIS Pro software, while statistical analyses were performed using Origin Lab Software. The results revealed a declining trend in groundwater levels, with variations influenced by aquifer characteristics and topography. This decline in groundwater levels appears to be linked to precipitation changes in Kentucky, where increased rainfall during the wet season annually does not significantly contribute to groundwater recharge, while reduced rainfall in the dry season leads to a decline in groundwater levels. Also, distinct correlations between changing temperature and precipitation patterns were observed in some areas. The dynamics of groundwater flow velocity were found to be impacted by climate changes. This research contributes valuable insights to our understanding of the long-term effects of climate change on groundwater flow dynamics.

Project Dissemination:

Lennex-stone, J., Marsh, C., Kibria, M.G., 2024., Analyzing Spatial Relationships Between Long-Term Groundwater Monitoring Data and Climatic Data for Comprehensive Understandings. Geological Society of America Abstracts with Programs. Vol. 56, No. 2, 2024. doi: 10.1130/abs/2024SE-398628

Lennex-stone, J., Kibria, M.G., 2024., Exploring Spatial Relationships Between Long-Term Groundwater Monitoring and Climatic Data of Kentucky. Poster presented at the 19th Annual Celebration of Student Scholarship, April 17, 2024, Morehead State University, Morehead, KY.

Awards and/or Honors: N/A

Post-Graduation Plans (Seniors Only): N/A

Litton, Ivy

Major: ENSI

Faculty Mentor: Wilson Gonzalez-Espada

Research/Project Title: Meteorology Misconceptions Held by Students in an Earth Science College Course for Preservice K-5 Teacher

Project Abstract/Summary: When planning to enter the field of education, future teachers must have a thorough understanding of the content they are preparing to teach. In meteorology, in particular, previous studies have shown that teachers often have misconceptions regarding weather patterns and terminology. With the implementation of weather-related elementary KY Science Standards (K-ESS2-1; K-ESS3-2, 3-ESS2-1; 3-ESS2-2; 3-ESS3-1, and 5-ESS2-1), future teachers must give their students a solid foundational understanding of weather conditions vital to their daily lives.

This study identified to what extent weather misconceptions persisted after 22 college students completed ESS112, a course for future K-5 science educators, as measured by their performance on a recently created Survey of Meteorology Concepts (SMC), completed as a pre- and post-test. By examining participant data using psychometric statistics, survey data will also be used to validate the SMC.

The researchers found that the participants perceived the SMC as quite difficult (Diffpre = 0.29, Diffpost = 0.28, $t = 0.37$, $p = 0.716$), and only about 15% of them answered the items correctly and with high confidence. The survey revealed significant decreases in both Lucky Guesses (19% to 11%, $t = 4.69$, $p < 0.0001$) and Unlucky Guesses (57% to 40%, $t = 8.28$, $p < 0.0001$) and a significant but modest increase in Knowledge (10% to17%, $t = 3.53$, $p = 0.001$). Surprisingly, responses with Misconceptions more than

duplicated (14% to 32%, $t = 9.68$, $p < 0.0001$). The researchers will discuss the top misconceptions and recommendations to improve the SMC.

Project Dissemination:

Litton, I., González-Espada, W. J., Golam Kibria, M., and O'Keefe, J. (2024). Meteorology misconceptions held by students in an earth science college course for preservice K-5 teachers. Poster presented at the 19th Annual Celebration of Student Scholarship, April 17, Morehead State University, Morehead KY.

Litton, I., Nelson, K., González-Espada, W. J., Golam Kibria, M., and O'Keefe, J. (2024). Meteorology misconceptions held by students in general education and preservice earth science college courses. Oral presentation at the National Conference on Undergraduate Research, April 10, Long Beach Convention & Entertainment Center, Long Beach, CA.

Litton, I., O'Keefe, J., Kibria, M. G., & González-Espada, W. J. (2023). What misconceptions do future elementary science teachers have about the weather? Oral presentation at the 109th Kentucky Academy of Science Annual Meeting, November 4, Northern Kentucky University, Highland Heights, KY.

Awards and/or Honors: N/A

Post-Graduation Plans (Seniors Only): N/A

Marsh, Christopher

Major: Geoscience

Faculty Mentor: Md Golam Kibria

Research/Project Title: Application of a 3d Lithologic Model and The Drastic Approach for Aquifer Characterization in Northeastern Kentucky

Project Abstract/Summary: This study aimed to understand aquifer characteristics in four counties within Northeastern Kentucky comprehensively. Remote sensing, spatial analysis, and three-dimensional (3-D) lithologic modeling techniques, the research focused on evaluating groundwater potential in the specified region. The 3-D lithologic modeling techniques, commonly utilized for detailed characterization and modeling of shallow to intermediate aquifers, incorporated lithology data from approximately 250 wells to construct the model using Surfer software. A groundwater flow model was subsequently developed using MODFLOW 6, utilizing the outcomes of the lithologic model. The derived 3-D lithologic model unveiled an intricate shallow to intermediate aquifer system featuring diverse lithologic categories such as clay, clay and sand, shale, sand, sand and gravel, gravel, sandstone, and limestone. This system exhibited a range of hydraulic conductivities, which varied spatially and influenced groundwater flow. The spatial heterogeneity of the aquifer system was evident, with varying hydraulic conductivities in different directions. Hydraulic continuity was depicted through inter-fingering and the connection of sandy materials and fractures in limestone within the aquifer system. A groundwater vulnerability map was generated by integrating the 3-D model with GIS and DRASTIC models, considering seven hydrogeological factors. Generalized GIS-based hydrogeologic maps were extracted from diverse datasets, including satellite imagery, digital elevation models, soil data, lithological data, and rainfall data. Borehole data validated the results. The resulting groundwater potential map categorized areas into five ranks (Very Low, Low, Moderate, High, and Very High potential) based on availability. The study effectively compared and integrated the 3-D aquifer model and DRASTIC models, providing crucial insights for sustainable groundwater development and management.

Project Dissemination:

Marsh, C., Kibria, M.G., 2024., Application of a 3d Lithologic Model and The Drastic Approach for Aquifer Characterization in Northeastern Kentucky. Geological Society of America Abstracts with Programs. Vol. 56, No. 2, 2024. doi: 10.1130/abs/2024SE-398279

Lennex-stone, J., Marsh, C., Kibria, M.G., 2024., Analyzing Spatial Relationships Between Long-Term Groundwater Monitoring Data and Climatic Data for Comprehensive Understandings. Geological Society of America Abstracts with Programs. Vol. 56, No. 2, 2024. doi:10.1130/abs/2024SE398628

Marsh, C., Kibria, M.G., 2024., Utilizing 3D Lithologic Modeling and the DRASTIC Method for Aquifer

Characterization in Northeastern Kentucky. Poster presented at the 19th Annual Celebration of Student Scholarship, April 17, 2024, Morehead State University, Morehead, KY.

Awards and/or Honors: N/A

Post-Graduation Plans (Seniors Only): Plans to apply for graduate school in Fall 2025.

Nelson, Kaitlyn

Major: ENSI

Faculty Mentor: Wilson Gonzalez-Espada

Research/Project Title: Meteorology Misconceptions Held by Students in a General Education Earth Science College Course

Project Abstract/Summary: One of the goals of K-12 science education is to help future citizens become scientifically literate, that is, they should be able to understand science concepts and how science creates evidence, assess its significance, and make informed decisions based on this information. Since weather is one of the natural events people are constantly exposed to, meteorology literacy is of critical importance. However, researchers have noted that the public has a limited understanding of how the atmosphere works. To promote weather literacy, one crucial step is to assess the meteorology knowledge of college students completing general education earth science courses.

This study identified to what extent weather misconceptions persisted after 38 college students completed ESS 102 (Dangerous Planet), as measured by their performance on a recently created Survey of Meteorology Concepts (SMC), completed as a pre- and post-test. By examining participant data using psychometric statistics, survey data will also be used to validate the SMC.

The researchers found that the participants perceived the SMC as somewhat difficult (Diffpre = 0.31, Diffpost =0.40, $t = 6.06$, $p < 0.0001$), and only about 20% of them answered the items correctly and with high confidence. The survey revealed significant decreases in both Lucky Guesses (18% to 15%, $t = 2.37$, $p = 0.022$) and Unlucky Guesses (54% to 41%, $t = 8.27$, $p < 0.0001$) and a significant but modest increase in Knowledge (14% to 25%, $t = 7.21$, $p < 0.0001$). Surprisingly, responses with Misconceptions increased (14% to 19%, $t = 4.03$, $p = 0.0002$). The researchers will discuss the top misconceptions and recommendations to improve the SMC.

Project Dissemination:

Nelson, K., González-Espada, W. J., Golam Kibria, M., and O'Keefe, J. (2024). Meteorology misconceptions held by students in a general education earth science college course. Poster presented at the 19th Annual Celebration of Student Scholarship, April 17, Morehead State University, Morehead KY.

Litton, I., Nelson, K., González-Espada, W. J., Golam Kibria, M., and O'Keefe, J. (2024). Meteorology misconceptions held by students in general education and preservice earth science college courses. Oral presentation at the National Conference on Undergraduate Research, April 10, Long Beach Convention & Entertainment Center, Long Beach, CA.

Nelson, K. & González-Espada, W. J. (2024). Meteorology misconceptions held by college students in a general education earth science class. Poster presented at the 2004 Annual Meeting of the American Association for the Advancement of Science/American Junior Academy, Colorado Convention Center, February 14, Denver CO.

Nelson, K., O'Keefe, J., Kibria, M. G., & González-Espada, W. J. (2023). Meteorology misconceptions held by college students in a general education earth science class. Oral presentation at the 109th Kentucky Academy of Science Annual Meeting, November 4, Northern Kentucky University, Highland Heights, KY.

Awards and/or Honors: Kentucky Junior Academy District 5 Delegate, 2024 American Junior Academy of Science/American Association for the Advancement of Science Meeting

Post-Graduation Plans (Seniors Only): N/A

Patel, Mann

Major: Computer Science

Faculty Mentor: Heba Elgazzar

Research/Project Title: Classification of Road Objects using Convolutional Neural Network

Project Abstract/Summary: Driving is the primary means of transportation for many people around the world. Whether the use is to assist human drivers or create autonomous driving, the use of machine learning can create safer road conditions. For example, road sign classification is a road object classification problem tackled by many researchers [1] [2] [3] [4] [5]. Drivers must also consider the other objects on the road, most commonly other vehicles, and pedestrians. These three components, road signs, pedestrians, and vehicles make up a large majority of objects that a driver will encounter when on the road. This paper will apply machine learning methods, specifically Convolutional Neural Networks (CNN), to classify these road objects. The goal is to create a classification model that can reliably classify road objects and classify the different road signs into individual classes. The results showed high accuracy in classifying the objects, even at lower resolutions and poor conditions.

Project Dissemination:

"Classification of Road Objects using Convolutional Neural Networks", Proceedings of the 13th IEEE Annual Computing and Communication Workshop and Conference (IEEE CCWC 2023), pp. 326 332, March 2023. DOI: 10.1109/CCWC57344.2023.10099093.

Oral presentation at 2023 MSU Students Scholarship celebration

Poster presentation at 2023 Posters at the Capitol

Awards and/or Honors: Best Paper Award in the category of Artificial Intelligence and Machine Learning from the 13th IEEE Annual Computing and Communication Workshop and Conference (IEEE CCWC 2023).

Exceptional Merit Award,2023 MSU Students Scholarship celebration.

Post-Graduation Plans (Seniors Only): N/A

Phillips, Linzee

Major: Physics

Faculty Mentor: Kevin Adkins

Research/Project Title: Finalizing a Raspberry Pi Powered All-Sky Camera

Project Abstract/Summary: This project is a continuation of one which began two years ago. Constant and steady progess has been made over the years to perfect this device, which is a camera that will take an all-sky image of the night sky at the same time a sky brightness reading is collected from a Sky Quality Meter (SQM). This particular year has been plagued with issues arising from the recent MSU cyber attack. Presently we have the camera online finally and are finally back into the phase of testing to move the hardware forward.

Project Dissemination: N/A

Awards and/or Honors: N/A

Post-Graduation Plans (Seniors Only): N/A

Schwegman, Brayden

Major: Astrophysics

Faculty Mentor: Jennifer Birriel

Research/Project Title: Novel Uses of Sky Quality Meters in Astronomy

Project Abstract/Summary: Unihedron Sky Quality Meters (SQMs) were designed to measure night sky brightness at zenith. However, these instruments have also been used to study lunar eclipses and twilight sky brightness. The student will use a bank of SQMs filtered in the red, green, blue, and clear bands to study scattered sunlight at twilight and both lunar and solar eclipses. Results will be compared with existing theoretical model.

The student has made numerous measurement of twilight data under a variety of lunar conditions. Analysis is proving challenging but we are making progress. The student and faculty mentor have also successfully obtained data from the April 2024 total solar eclipse from two different locations. These data will be analyzed and presented in Fall 2024.

Project Dissemination: 2024 Annual Celebration of Student Scholarship

Awards and/or Honors: N/A

Post-Graduation Plans (Seniors Only): N/A

Smith, Andrew

Major: Computer Science
Faculty Mentor: Kouroush Jenab
Research/Project Title: An LSTM Approach for Quality Prediction in a Mining Process with Ensemble Data Interpolation
Project Abstract/Summary: The presence of silica in iron ore concentrate can have significant negative impacts on the efficiency and quality of steel production. As such, providing engineers with early and reliable information about the purity of iron ore concentrate is crucial for smooth mining operations. This paper reports the development of a long short-term memory (LSTM) network and an ensemble data interpolation technique to enhance quality prediction in the froth flotation process of an iron ore mine. Our results demonstrate the ability of our model to accurately predict the silica content of iron ore concentrate on a minute-by-minute basis, as well as the ability to forecast hours in advance.
Project Dissemination: Publication(s):
Under review at the *International Journal of Artificial Intelligence Tools.*
Awards and/or Honors: N/A
Post-Graduation Plans (Seniors Only): Employed at the Rajant Corporation.

Taylor, Ashleigh

Major: Computer Science
Faculty Mentor: Kouroush Jenab
Research/Project Title: Spare Parts Analysis from Scrambled Data using Machine Learning
Project Abstract/Summary: This research project focuses on the development of a computer vision application to detect diseases in four of Kentucky's most commonly exported crops: soybeans, corn, wheat, and tobacco. Using the state-of-the-art YOLOv8 object detection algorithm, we aim to create a robust and versatile tool for disease detection and classification. To facilitate this, we curated and annotated a comprehensive image dataset composed of various disease states and healthy samples for each crop. Our long-term objective is to adapt this application for deployment on drones, which can fly over farms, capturing images and enabling rapid and widespread disease detection, offering farmers the opportunity to respond promptly to potential threats. This research represents a significant contribution to precision agriculture and crop management, addressing the need for efficient disease detection methods in a rapidly evolving agricultural landscape. The integration of computer vision and drone technology has the potential to revolutionize crop monitoring, improve yield predictions, and enhance overall farm productivity, thereby ensuring food security and economic sustainability in Kentucky and beyond.
Project Dissemination: Taylor, Ashleigh; Ward, Tyler; Jenab, Kouroush; and Ortega-Moody, Jorge (2024, October*). Spare Parts Analysis from Scrambled Data using Machine Learning,* ATMAE Annual Conference, Las Vegas, NV, October, 2024.
Awards and/or Honors: N/A
Post-Graduation Plans (Seniors Only): N/A

Mathematics

Breitenbach, Faith

Major: Middle Grades Education
Faculty Mentor: Will Tidwell
Research/Project Title: Combating Cognitive Dissonance, Bias, and Misinformation with Mathematical Modeling
Project Abstract/Summary: Social media and limitless access to resources influence our daily lives, communication, and thought processes. These abundant resources can provide us with helpful information, information that might not be entirely accurate, or information that might be meant as harmful. People must be able to spot false information in order to become more informed. If citizens are not equipped to pinpoint misinformation --- and, by extension, disinformation, how will they ensure they are making the best decisions given proper information and tools? We wanted to give students this power to distinguish misinformation, and we attempted to do this by engaging our students in mathematical modeling.

Mathematical modeling is the process in which people consider and make sense of a situation that will be analyzed using mathematics for the purpose of understanding, explaining, or predicting something. It allows people to grapple with complex problems and situations to better understand the world around them. Literature suggests that modeling benefits students' ability to communicate. In a pilot study, we used mathematical modeling to give students the tools to identify misinformation but found cognitive dissonance was a barrier to fully utilizing the skills learned. Students would begin to respond with a data-driven argument but would then insert their own opinion when the data presented did not mesh with their beliefs. We hypothesized that the tools needed to identify misinformation are developed over a period longer than a semester intervention. We posit that through this intervention to improve communication, it will help them in reading the world and identifying misinformation. In 3 courses focused on mathematical modeling and computer programming, we implemented four journaling activities with a control group and a group that had cognitive bias training. The journaling activities allowed for the students to investigate a preselected article and were spread out over the course of the semester. This semester, Ms. Breitenbach worked to illuminate the background research for future implementations to the study. She researched and found a multitude of different articles to further expand the background literature as well as informing future directions for the project.

Project Dissemination:

Breitenbach, Faith C., Doderer, Adaline (Honors URF), Rast, Lauren (professor), and Tidwell, Will (2024, November). Combating Cognitive Dissonance, Bias, and Misinformation with Mathematical Modeling, The School Science and Mathematics Association Conference, Knoxville, Tennessee, November, 2024.

Awards and/or Honors: N/A

Post-Graduation Plans (Seniors Only): N/A

Psychology

Brown, Johnna

Major: Psychology

Faculty Mentor: Greg Corso

Research/Project Title: A) Divergent creative problem-solving in the context of working memory and field dependence/independence.

B) Convergent creative problem-solving in the context of working memory and field dependence/independence.

C) The effect of colored noise on recall accuracy, study time, and latency.

D) The relationship between attitudes about colored noise and annoyance or helpfulness ratings.

E) Recognition accuracy for 2-dimensional shapes differing in presentation angle.

F) Recall task performance under different wavelengths of light.

Project Abstract/Summary: A) Abstract Problem

Previous research suggests a relationship between working memory capacity (WMC) and field dependence/independence (FDI) and problem-solving performance. The research presented here more closely investigated that relationship by identifying whether problem-solving requiring divergent thinking or convergent thinking is differentially related to measures of working memory and field dependence/independence. A divergent thinking task has multiple solutions and is not restricted by response expectations, whereas a convergent thinking task has one ideal solution. There is an abundance of research on working memory and field independence and its positive relationship to performance on convergent thinking tasks, but the literature is lacking on that relationship relevant to divergent thinking tasks. This investigation incorporated both convergent and divergent thinking tasks as well as measures of WMC (Operation Span or OSPAN) and FDI (Embedded Figures Test or EFT). It was hypothesized that larger working memory capacity and greater field independence should be related to improved performance on divergent thinking tasks. Additionally, a positive relationship between working memory capacity and field independence was hypothesized. The convergent task portion of this study is reported in a different abstract.

Method

All participants completed the OSPAN and EFT to measure WMC and FDI. The OSPAN presents participants with a series of math problems followed by letters which they are instructed to recall at the end of the math series. The EFT measures field dependence/independence by requiring participants to trace target images within complex figures. Participants were randomly assigned to one of two divergent thinking tasks, the Alternative Use Task (AUT) or the Figural Interpretation Quest Task (FIQT). The AUT required participants to identify alternative uses for everyday objects (coffee cup, paperclip, straw) that are different from their typical use. The FIQT required participants to list interpretations of what an ambiguous figure could potentially illustrate. Both the AUT and FIQT were scored using an inter-rater scoring method. Participants were also randomly assigned to one of two convergent thinking tasks.

Results

For each participant (N=46), the OSPAN absolute score (the sum of perfectly recalled letter sets), the EFT score (the number of shapes correctly traced in a 30-second per shape timeframe), the AUT, and the FIQT scores were recorded. Results showed a significant positive correlation between OSPAN and EFT scores, $r(44) = .46$, $p = .001$. This result supports the hypothesized positive relationship between larger Working Memory Capacity and greater Field Independence. Additional results showed a significant positive correlation between scores from the FIQT x OPSAN ($r(21) = .5$, $p = .015$) and scores from the FIQT x EFT ($r(21) = .47$, $p = .024$) but not the scores from the AUT. These results partially support the hypothesis because only a significant correlation between one divergent task, OSPAN, and EFT was observed. Additional analyses are underway.

Conclusion

Implications for this study would suggest greater creative capabilities for individuals with a larger WMC and greater field independence. Greater creative abilities refer to an aptitude for problem-solving that requires “outside of the box” thinking. Additionally, greater creative capabilities are important for school or work-related tasks that require cognitive flexibility.

B) Abstract Problem

The relationship between working memory capacity (WMC), measured with the Operational Span Task, and field dependence/independence (FDI), measured with the Embedded Figures Task, relative to convergent thinking creative problem-solving tasks was investigated. Previous research suggested a positive relationship between WMC and FDI. However, this relationship is seldom measured; rather, it has been mostly assumed. Additionally, individuals with a larger WMC and greater FI should perform better on convergent thinking tasks; these require an individual to arrive at one ideal and defined solution when presented with a novel problem. Previous research has investigated the relationship between WMC, FDI, and convergent thinking problem-solving tasks and found positive correlations between the three. The current study looked at creative problem-solving tasks requiring convergent thinking, a specific area not thoroughly investigated. Higher WMC and FDI were hypothesized to correlate with increased performance on creative convergent thinking tasks.

Method

At the beginning of the session, various pre-tasks (informed consent, instructions, eye tests) were administered. After completing those tasks, the OSPAN and the EFT were administered. The OPSAN measures working memory capacity by presenting participants with a series of letters followed by a math problem, then requiring participants to recall each letter in order. The EFT measured field dependence/independence by requiring participants to trace target images within complex figures. The Visual Remote Association Task (vRAT), Candle Problem (CP), and Two String Problem (TSP) were used as convergent creative thinking tasks. Participants were randomly assigned to perform the CP/TSP tasks or the vRAT. The vRAT required the identification of a target word that formed compound words with three given words (e.g., given words: scout, friend, flower; target word: girl). The CP required participants to attach a candle to a wall using a matchbox and pushpins. The TSP required participants to tie two strings together using various objects. The strings were hanging from the ceiling and spaced far apart. During each of the three convergent tasks, latency and solution measures were obtained.

Results

The data from undergraduates (n=46) were analyzed. A significant positive correlation between OSPAN and EFT scores, $r(44) = .46$, $p = .001$ was observed, supporting the hypothesis that larger working memory

capacity relates to greater field independence. A significant correlation was observed between vRAT and EFT scores, $r(21) = .42$, $p = .044$. This finding partially supports the hypothesis that individuals who are field-independent would perform better on creative problem-solving tasks that require convergent thinking, since a significant correlation with only one of the convergent thinking creative tasks was observed.

Conclusion

Implications suggest that individuals with larger WMC and greater field independence have more advanced convergent thinking capabilities and creative problem-solving abilities. These findings should translate to classroom and work environments to identify individuals with solution-seeking tendencies. Strategies to increase performance in these various settings may be developed and utilized based on our findings.

C) Abstract Problem

Colored noise, noise categorized by color based on frequency and intensity, has been shown to have differential effects on cognitive performance (Söderlund & Sikström, 2008). However, much of the literature investigating the effects of colored noise is limited to white noise and only applies to populations with attention-deficit/ hyperactivity disorder (ADHD). This study investigated a spectrum of colored noises (White, Brown, Pink) on latency and recall accuracy for non-ADHD populations. It was hypothesized that latency, duration of study time, and recall accuracy would be greater for the White-Noise, Brown-Noise, and Pink-Noise conditions than in the No-Noise condition. It was also hypothesized that differences in frequency would result in differences for latency, duration of study time, and recall accuracy across the colored noise conditions.

Method

After signing the informed consent form, undergoing hearing, eye, and colorblindness exams, participants underwent an exposure session to become familiar with the colored noises used in the study. A pre-survey asking about their prior knowledge and uses for the three noises was administered. Next, the participants were assigned to one of four noise conditions. (White-Noise, Brown-Noise, Pink-Noise, or No-Noise). Three separate tasks were used in the study and all participants completed the three tasks. The overall design was a 3 (task) by 4 (noise-condition) mixed design. The three tasks included Task-A memorizing a matrix of two-digit number-object image combinations, Task-B memorizing a matrix of color-noun combinations, and Task-C memorizing a matrix of color-shape combinations. For each task, the combinations were studied for up to ten-minutes. Then, during the recall an identical matrix without the items to be recalled was presented. For Task-A, the matrix of objects was presented, and participants were required to recall the two-digit number. For Task-B, the matrix of nouns was presented and the color for each item was required to be recalled. For Task-C, the matrix of shapes was presented, and the color associated with each shape was required to be recalled. For all three tasks, an interference task separated the study phase and the recall phase. The interference task required participants to attend to colors of squares presented in a series and indicate whether a given color had appeared in the series. Task-A, Task-B, and Task-C were sequential, but the order was randomized. After completing the tasks, participants were administered a post-survey about their opinion of the noise environment.

Results

Undergraduate students ($n = 73$) participated for class credit. Dependent variables included recall accuracy, duration of study time, and latency of recall. Several derived variables, based on the dependent variables, were subjected to analysis of variance. However, the analysis resulted in no significant differences among noise conditions or for the derived measures. Likewise, there were no significant differences for the original dependent measures.

Conclusion

Our initial hypotheses suggesting that colored noise had effects on accuracy or latency were not supported. Personal preference and the specific task may play a role in the effectiveness of colored noise. Further investigation of individual differences and utilization of more diverse tasks may be beneficial.

D) Abstract Problem

Across various media, there are suggestions that different color noises, defined by differences in the frequency spectrum of the sound, may benefit different mental conditions. This study analyzed participant attitudes about colored noise after task completion. It was hypothesized that participants who reported experience with the effective use of colored noise in the pre-survey would rate the noises presented in this

study as lower in annoyance and higher in helpfulness in the post-survey than participants without previous experience with the noises. Additionally, it was expected that the helpfulness and annoyance levels would be different for the different color noises.

Method

Four different colored noise conditions: White-Noise, Brown-Noise, Pink-Noise, and No-Noise were used. Participants (n = 73) were randomly assigned to one of the four noise conditions. All participants completed an exposure task. During the task, participants listened to the three colored noises and were asked to identify each as they were presented. Participants then completed a self-report pre-task survey to determine familiarity and prior use of the colored noises. They were asked to (A) identify if they had previously encountered any of the three noises; (B) if they had used any of the three noises; and, (C) if the noise was effective. Three different memory tasks were within-subject variables. The tasks are described, and the performance results are presented in another abstract. A self-report post-task survey was administered to the participants (n = 57) in the three noise groups (White, Brown, and Pink). The survey asked about the helpfulness and annoyance of the noise. Two separate five-point Likert scales were used. One scale was concerned with the Helpfulness of the noise, with a "1" rating being least helpful and a "5" rating being most helpful. The other rating scale was concerned with the Annoyance of the noise, with a "1" rating indicating that the noise was least annoying and a "5" rating indicating that the noise was most annoying. Also asked was why they chose their rating. The post-task survey was not administered to participants assigned to the no-noise condition because there was no noise to induce annoyance or helpfulness.

Results

There was a significant negative correlation between Helpfulness ratings and Annoyance ratings. [$r(55) = -0.51$, $p < .001$]. No significant correlations existed between Reported Previous Use Effectiveness and Helpfulness/Annoyance ratings.

Conclusion

The overall finding of this study is that if the colored noise is annoying, its helpfulness decreases. Since no significant correlation was found between reported previous use effectiveness and helpfulness/annoyance, we can suggest that prior use of colored noise does not affect helpfulness for future uses. It should also be noted that incorporating color noise in different tasks might result in different levels of annoyance and helpfulness.

E) Abstract Problem

The proposed research investigates shape recognition as the presentation angle of 2-Dimensional shapes change. Some shape rotation tasks require participants to initiate rotation of a shape until it is congruent with the angle of a target shape. Research manipulating whole shapes in a continuous rotation situation has been investigated. Lacking in the literature is recognition performance data for 2-dimensional targets when presentation angle changes appear to be lacking. Additionally, information about aphantasia within participant samples appears to be lacking. We are seeking feedback about the proposed methods.

Method

We believe a signal detection paradigm might be the best way to proceed, but we are seeking feedback on this approach. Being considered are 2-dimensional shapes including square, circle, rectangle, triangle, oval, and star. Additionally, the angle of x-axis rotation will range from 0 degrees rotation to 90 degrees rotation in 2-degree steps. At the start of the trial a target will be presented. The target will be a shape presented at 90 degrees from the horizon so it will be able to be clearly recognized. To use a signal detection paradigm, a signal trial and a noise need to be constructed. The signal trial could be all the shapes minus one shape presented simultaneously, with the noise trial being all shapes except the target trial. We would present 25 target trials and 25 noise trials and hold the presentation angle constant for all 50 trials. For trials 51 to 100 a randomly selected presentation angle would be selected and used for the same target. This procedure will continue until all shapes and all angles are presented. Using 45 angles with 50 signal/noise trials results in 2250 trials for one shape. For six shapes 13,500 trials would be required. The response would be target present or target not present. We do not think this approach is doable. A different approach and at the other extreme, would be to present the target shape at different presentation angles in an ascending and descending manner – stopping when participant says yes, it is the target, or no, it is not the target. There would be no noise items and each target shape would be presented alone. If we used 5 ascending angle

trials, starting from 0-degrees and increasing by 2-degrees after each response until 90-degrees was reached) and 5 descending angle trials that would result in a maximum of 450 trials per shape. Shape would be a between-subject variables with 10 participants per shape. However, if different recognition angles for the different shapes occur, group differences may be the cause and not object differences. Using the second approach, catch trials for each shape and angle would have to be used within the series. A Vividness of Visual Imagery Questionnaire will be administered to assess aphantasia.

Results

Psychophysical plots will be constructed, and threshold or mean d' and Beta values will be computed.

Conclusion

These results could fill a void in the perceptual literature, and they might be useful in reducing shape recognition errors in augmented displays.

F)Abstract Problem

People often use different colors of light for different tasks. Different wavelengths of light therapy are used for treatments such as pain relief (Martin et al., 2022). Light therapy is also used as a possible method of treating seasonal affective disorder (Oren et al., 1991; Strong et al., 2009). There is also evidence that light therapy can improve cognition in elderly participants (Royer et al., 2012). However, there is little research on how different wavelengths of light affect memory tasks. This proposed study seeks to investigate performance on recall tasks under different wavelengths of light. Red, Green, Blue, and White are proposed light conditions as a between-subject variable. We hypothesize that different emotions may be invoked in the different wavelengths of light, and therefore, we suspect there will be significant differences in recall performance across different light conditions.

Method

While participants are being color light-adapted, the participants (minimum of 32) will be asked about their use of colored lights on a pre-survey. In the color light adapted situation, the participants will complete a practice recall task and a Jenga task in the remaining adaptation period. Memory tasks will begin after about 20 minutes in the color-adapted situation. Four lists will be used for the memory tasks – each list will contain ten items of four-letter words, eight-letter words, two-digit numbers, or three-digit numbers. The computer will read the first randomly assigned list to the participant. Stimulus onset asynchrony interval and duration for the time between presentation and recall will be determined by a pilot study. The participant will then complete a distraction task: playing Jenga. When a cue to recall is presented, the participant must recall the items as quickly as possible. There is no recall time limit, but the total time to recall will be recorded. The next list requiring study will be presented at the end of the recall period. A pilot study will determine the interval between the end of the recall period and the beginning of the next study period. The same procedure will be followed for the remaining three recall task lists. A post-survey will ask the participant to rate the light condition on a five-point Likert scale for annoyance, helpfulness, and distractibility. The post-survey will also ask participants to indicate their current mood from the light and why.

Results

The percent correct for each task will be subjected to an ANOVA with light color as the grouping variable and the four tasks as a within-subject variable. Also analyzed will be the ratings from the three scales.

Conclusion

Implications for the expected findings would suggest alternative environments in which to study for assessments and exams. Listening to lectures in different lighting is a practical implication for the possible findings of this study. The findings of significant differences between the color light groups might play a role in situations where accuracy is essential.

Project Dissemination:

A. Brown, J., Stubblefield, G., Yates, J., Cornelius, M., Leonard, M., Westwood, C., & Corso, G. M. (2024, March). *Divergent creative problem-solving in the context of working memory and field dependence/independence.* Poster Presentation, Southwestern Psychological Association Annual Meeting, San Antonio, TX.
   - Also presented at the Celebration of Student Scholarship, Morehead, KY. (2024, April).

B. Stubblefield, G., Brown, J., Yates, J., Cornelius, M., Leonard, M., Westwood, C., & Corso, G. M. (2024, March). *Convergent creative problem-solving in the context of working memory and field dependence/independence*. Poster Presentation, Southwestern Psychological Association Annual Meeting, San Antonio, TX.
   - Poster presentation at the Annual Meeting of Posters at the Capitol, Frankfort, KY. (2024, March)
   - Also presented at the Celebration of Student Scholarship, Morehead, KY. (2024, April).

C. Cornelius, M., Leonard, M., Westwood, C., Brown, J., Stubblefield, G., Yates, J., & Corso, G. M. (2024, March). *The effect of colored noise on recall accuracy, study time, and latency.* Poster Presentation, Southwestern Psychological Association Annual Meeting, San Antonio, TX.
   - Also presented at the Celebration of Student Scholarship, Morehead, KY. (2024, April).

D. Leonard, M., Westwood, C., Cornelius, M., Brown, J., Stubblefield, G., Yates, J., & Corso, G. M. (2024, March). *The relationship between attitudes about colored noise and annoyance or helpfulness ratings.* Poster Presentation, Southwestern Psychological Association Annual Meeting, San Antonio, TX.
   - Also presented at the Celebration of Student Scholarship, Morehead, KY. (2024, April).

E. Yates, J., Brown, J., Cornelius, M., Stubblefield, G., Leonard, M., Westwood, C., & Corso, G. M. (2024, March). *Recognition accuracy for 2-dimensional shapes differing in presentation angle.* Poster Presentation, Southwestern Psychological Association Annual Meeting, San Antonio, TX.

F. Westwood, C., Brown, J., Cornelius, M., Stubblefield, G., Leonard, M., Yates, J., & Corso, G. M. (2024, March). *Recall task performance under different wavelengths of light.* Poster Presentation, Southwestern Psychological Association Annual Meeting, San Antonio, TX.

Awards and/or Honors: N/A

Post-Graduation Plans (Seniors Only): Ph.D. program – University of Alabama. Full ride

Cornelius, Madison

Major: Psychology

Faculty Mentor: Greg Corso

Research/Project Title: A) Divergent creative problem-solving in the context of working memory and field dependence/independence.

B) Convergent creative problem-solving in the context of working memory and field dependence/independence.

C) The effect of colored noise on recall accuracy, study time, and latency.

D) The relationship between attitudes about colored noise and annoyance or helpfulness ratings.

E) Recognition accuracy for 2-dimensional shapes differing in presentation angle.

F) Recall task performance under different wavelengths of light.

Project Abstract/Summary: A) Abstract Problem

Previous research suggests a relationship between working memory capacity (WMC) and field dependence/independence (FDI) and problem-solving performance. The research presented here more closely investigated that relationship by identifying whether problem-solving requiring divergent thinking or convergent thinking is differentially related to measures of working memory and field dependence/independence. A divergent thinking task has multiple solutions and is not restricted by response expectations, whereas a convergent thinking task has one ideal solution. There is an abundance of research on working memory and field independence and its positive relationship to performance on convergent thinking tasks, but the literature is lacking on that relationship relevant to divergent thinking tasks. This investigation incorporated both convergent and divergent thinking tasks as well as measures of WMC (Operation Span or OSPAN) and FDI (Embedded Figures Test or EFT). It was hypothesized that larger working memory capacity and greater field independence should be related to improved performance on divergent thinking tasks. Additionally, a positive relationship between working memory capacity and field independence was hypothesized. The convergent task portion of this study is reported in a different abstract.

Method

All participants completed the OSPAN and EFT to measure WMC and FDI. The OSPAN presents participants with a series of math problems followed by letters which they are instructed to recall at the end

of the math series. The EFT measures field dependence/independence by requiring participants to trace target images within complex figures. Participants were randomly assigned to one of two divergent thinking tasks, the Alternative Use Task (AUT) or the Figural Interpretation Quest Task (FIQT). The AUT required participants to identify alternative uses for everyday objects (coffee cup, paperclip, straw) that are different from their typical use. The FIQT required participants to list interpretations of what an ambiguous figure could potentially illustrate. Both the AUT and FIQT were scored using an inter-rater scoring method. Participants were also randomly assigned to one of two convergent thinking tasks.

Results

For each participant (N=46), the OSPAN absolute score (the sum of perfectly recalled letter sets), the EFT score (the number of shapes correctly traced in a 30-second per shape timeframe), the AUT, and the FIQT scores were recorded. Results showed a significant positive correlation between OSPAN and EFT scores, r (44) =.46, p=.001. This result supports the hypothesized positive relationship between larger Working Memory Capacity and greater Field Independence. Additional results showed a significant positive correlation between scores from the FIQT x OPSAN (r (21) = .5, p=.015) and scores from the FIQT x EFT (r (21) =.47, p=.024) but not the scores from the AUT. These results partially support the hypothesis because only a significant correlation between one divergent task, OSPAN, and EFT was observed. Additional analyses are underway.

Conclusion

Implications for this study would suggest greater creative capabilities for individuals with a larger WMC and greater field independence. Greater creative abilities refer to an aptitude for problem-solving that requires “outside of the box” thinking. Additionally, greater creative capabilities are important for school or work-related tasks that require cognitive flexibility.

B) Abstract Problem

The relationship between working memory capacity (WMC), measured with the Operational Span Task, and field dependence/independence (FDI), measured with the Embedded Figures Task, relative to convergent thinking creative problem-solving tasks was investigated. Previous research suggested a positive relationship between WMC and FDI. However, this relationship is seldom measured; rather, it has been mostly assumed. Additionally, individuals with a larger WMC and greater FI should perform better on convergent thinking tasks; these require an individual to arrive at one ideal and defined solution when presented with a novel problem. Previous research has investigated the relationship between WMC, FDI, and convergent thinking problem-solving tasks and found positive correlations between the three. The current study looked at creative problem-solving tasks requiring convergent thinking, a specific area not thoroughly investigated. Higher WMC and FDI were hypothesized to correlate with increased performance on creative convergent thinking tasks.

Method

At the beginning of the session, various pre-tasks (informed consent, instructions, eye tests) were administered. After completing those tasks, the OSPAN and the EFT were administered. The OPSAN measures working memory capacity by presenting participants with a series of letters followed by a math problem, then requiring participants to recall each letter in order. The EFT measured field dependence/independence by requiring participants to trace target images within complex figures. The Visual Remote Association Task (vRAT), Candle Problem (CP), and Two String Problem (TSP) were used as convergent creative thinking tasks. Participants were randomly assigned to perform the CP/TSP tasks or the vRAT. The vRAT required the identification of a target word that formed compound words with three given words (e.g., given words: scout, friend, flower; target word: girl). The CP required participants to attach a candle to a wall using a matchbox and pushpins. The TSP required participants to tie two strings together using various objects. The strings were hanging from the ceiling and spaced far apart. During each of the three convergent tasks, latency and solution measures were obtained.

Results

The data from undergraduates (n=46) were analyzed. A significant positive correlation between OSPAN and EFT scores, r (44) = .46, p = .001 was observed, supporting the hypothesis that larger working memory capacity relates to greater field independence. A significant correlation was observed between vRAT and EFT scores, r (21) = .42, p = .044. This finding partially supports the hypothesis that individuals who are

field-independent would perform better on creative problem-solving tasks that require convergent thinking, since a significant correlation with only one of the convergent thinking creative tasks was observed.

Conclusion

Implications suggest that individuals with larger WMC and greater field independence have more advanced convergent thinking capabilities and creative problem-solving abilities. These findings should translate to classroom and work environments to identify individuals with solution-seeking tendencies. Strategies to increase performance in these various settings may be developed and utilized based on our findings.

C) Abstract Problem

Colored noise, noise categorized by color based on frequency and intensity, has been shown to have differential effects on cognitive performance (Söderlund & Sikström, 2008). However, much of the literature investigating the effects of colored noise is limited to white noise and only applies to populations with attention-deficit/ hyperactivity disorder (ADHD). This study investigated a spectrum of colored noises (White, Brown, Pink) on latency and recall accuracy for non-ADHD populations. It was hypothesized that latency, duration of study time, and recall accuracy would be greater for the White-Noise, Brown-Noise, and Pink-Noise conditions than in the No-Noise condition. It was also hypothesized that differences in frequency would result in differences for latency, duration of study time, and recall accuracy across the colored noise conditions.

Method

After signing the informed consent form, undergoing hearing, eye, and colorblindness exams, participants underwent an exposure session to become familiar with the colored noises used in the study. A pre-survey asking about their prior knowledge and uses for the three noises was administered. Next, the participants were assigned to one of four noise conditions. (White-Noise, Brown-Noise, Pink-Noise, or No-Noise). Three separate tasks were used in the study and all participants completed the three tasks. The overall design was a 3 (task) by 4 (noise-condition) mixed design. The three tasks included Task-A memorizing a matrix of two-digit number-object image combinations, Task-B memorizing a matrix of color-noun combinations, and Task-C memorizing a matrix of color-shape combinations. For each task, the combinations were studied for up to ten-minutes. Then, during the recall an identical matrix without the items to be recalled was presented. For Task-A, the matrix of objects was presented, and participants were required to recall the two-digit number. For Task-B, the matrix of nouns was presented and the color for each item was required to be recalled. For Task-C, the matrix of shapes was presented, and the color associated with each shape was required to be recalled. For all three tasks, an interference task separated the study phase and the recall phase. The interference task required participants to attend to colors of squares presented in a series and indicate whether a given color had appeared in the series. Task-A, Task-B, and Task-C were sequential, but the order was randomized. After completing the tasks, participants were administered a post-survey about their opinion of the noise environment.

Results

Undergraduate students (n = 73) participated for class credit. Dependent variables included recall accuracy, duration of study time, and latency of recall. Several derived variables, based on the dependent variables, were subjected to analysis of variance. However, the analysis resulted in no significant differences among noise conditions or for the derived measures. Likewise, there were no significant differences for the original dependent measures.

Conclusion

Our initial hypotheses suggesting that colored noise had effects on accuracy or latency were not supported. Personal preference and the specific task may play a role in the effectiveness of colored noise. Further investigation of individual differences and utilization of more diverse tasks may be beneficial.

D) Abstract Problem

Across various media, there are suggestions that different color noises, defined by differences in the frequency spectrum of the sound, may benefit different mental conditions. This study analyzed participant attitudes about colored noise after task completion. It was hypothesized that participants who reported experience with the effective use of colored noise in the pre-survey would rate the noises presented in this study as lower in annoyance and higher in helpfulness in the post-survey than participants without previous

experience with the noises. Additionally, it was expected that the helpfulness and annoyance levels would be different for the different color noises.

Method

Four different colored noise conditions: White-Noise, Brown-Noise, Pink-Noise, and No-Noise were used. Participants (n = 73) were randomly assigned to one of the four noise conditions. All participants completed an exposure task. During the task, participants listened to the three colored noises and were asked to identify each as they were presented. Participants then completed a self-report pre-task survey to determine familiarity and prior use of the colored noises. They were asked to (A) identify if they had previously encountered any of the three noises; (B) if they had used any of the three noises; and, (C) if the noise was effective. Three different memory tasks were within-subject variables. The tasks are described, and the performance results are presented in another abstract. A self-report post-task survey was administered to the participants (n = 57) in the three noise groups (White, Brown, and Pink). The survey asked about the helpfulness and annoyance of the noise. Two separate five-point Likert scales were used. One scale was concerned with the Helpfulness of the noise, with a "1" rating being least helpful and a "5" rating being most helpful. The other rating scale was concerned with the Annoyance of the noise, with a "1" rating indicating that the noise was least annoying and a "5" rating indicating that the noise was most annoying. Also asked was why they chose their rating. The post-task survey was not administered to participants assigned to the no-noise condition because there was no noise to induce annoyance or helpfulness.

Results

There was a significant negative correlation between Helpfulness ratings and Annoyance ratings. [$r(55) = -0.51$, $p < .001$]. No significant correlations existed between Reported Previous Use Effectiveness and Helpfulness/Annoyance ratings.

Conclusion

The overall finding of this study is that if the colored noise is annoying, its helpfulness decreases. Since no significant correlation was found between reported previous use effectiveness and helpfulness/annoyance, we can suggest that prior use of colored noise does not affect helpfulness for future uses. It should also be noted that incorporating color noise in different tasks might result in different levels of annoyance and helpfulness.

E) Abstract Problem

The proposed research investigates shape recognition as the presentation angle of 2-Dimensional shapes change. Some shape rotation tasks require participants to initiate rotation of a shape until it is congruent with the angle of a target shape. Research manipulating whole shapes in a continuous rotation situation has been investigated. Lacking in the literature is recognition performance data for 2-dimensional targets when presentation angle changes appear to be lacking. Additionally, information about aphantasia within participant samples appears to be lacking. We are seeking feedback about the proposed methods.

Method

We believe a signal detection paradigm might be the best way to proceed, but we are seeking feedback on this approach. Being considered are 2-dimensional shapes including square, circle, rectangle, triangle, oval, and star. Additionally, the angle of x-axis rotation will range from 0 degrees rotation to 90 degrees rotation in 2-degree steps. At the start of the trial a target will be presented. The target will be a shape presented at 90 degrees from the horizon so it will be able to be clearly recognized. To use a signal detection paradigm, a signal trial and a noise need to be constructed. The signal trial could be all the shapes minus one shape presented simultaneously, with the noise trial being all shapes except the target trial. We would present 25 target trials and 25 noise trials and hold the presentation angle constant for all 50 trials. For trials 51 to 100 a randomly selected presentation angle would be selected and used for the same target. This procedure will continue until all shapes and all angles are presented. Using 45 angles with 50 signal/noise trials results in 2250 trials for one shape. For six shapes 13,500 trials would be required. The response would be target present or target not present. We do not think this approach is doable. A different approach and at the other extreme, would be to present the target shape at different presentation angles in an ascending and descending manner – stopping when participant says yes, it is the target, or no, it is not the target. There would be no noise items and each target shape would be presented alone. If we used 5 ascending angle trials, starting from 0-degrees and increasing by 2-degrees after each response until 90-degrees was

reached) and 5 descending angle trials that would result in a maximum of 450 trials per shape. Shape would be a between-subject variables with 10 participants per shape. However, if different recognition angles for the different shapes occur, group differences may be the cause and not object differences. Using the second approach, catch trials for each shape and angle would have to be used within the series. A Vividness of Visual Imagery Questionnaire will be administered to assess aphantasia.

Results

Psychophysical plots will be constructed, and threshold or mean d' and Beta values will be computed.

Conclusion

These results could fill a void in the perceptual literature, and they might be useful in reducing shape recognition errors in augmented displays.

F)Abstract Problem

People often use different colors of light for different tasks. Different wavelengths of light therapy are used for treatments such as pain relief (Martin et al., 2022). Light therapy is also used as a possible method of treating seasonal affective disorder (Oren et al., 1991; Strong et al., 2009). There is also evidence that light therapy can improve cognition in elderly participants (Royer et al., 2012). However, there is little research on how different wavelengths of light affect memory tasks. This proposed study seeks to investigate performance on recall tasks under different wavelengths of light. Red, Green, Blue, and White are proposed light conditions as a between-subject variable. We hypothesize that different emotions may be invoked in the different wavelengths of light, and therefore, we suspect there will be significant differences in recall performance across different light conditions.

Method

While participants are being color light-adapted, the participants (minimum of 32) will be asked about their use of colored lights on a pre-survey. In the color light adapted situation, the participants will complete a practice recall task and a Jenga task in the remaining adaptation period. Memory tasks will begin after about 20 minutes in the color-adapted situation. Four lists will be used for the memory tasks – each list will contain ten items of four-letter words, eight-letter words, two-digit numbers, or three-digit numbers. The computer will read the first randomly assigned list to the participant. Stimulus onset asynchrony interval and duration for the time between presentation and recall will be determined by a pilot study. The participant will then complete a distraction task: playing Jenga. When a cue to recall is presented, the participant must recall the items as quickly as possible. There is no recall time limit, but the total time to recall will be recorded. The next list requiring study will be presented at the end of the recall period. A pilot study will determine the interval between the end of the recall period and the beginning of the next study period. The same procedure will be followed for the remaining three recall task lists. A post-survey will ask the participant to rate the light condition on a five-point Likert scale for annoyance, helpfulness, and distractibility. The post-survey will also ask participants to indicate their current mood from the light and why.

Results

The percent correct for each task will be subjected to an ANOVA with light color as the grouping variable and the four tasks as a within-subject variable. Also analyzed will be the ratings from the three scales.

Conclusion

Implications for the expected findings would suggest alternative environments in which to study for assessments and exams. Listening to lectures in different lighting is a practical implication for the possible findings of this study. The findings of significant differences between the color light groups might play a role in situations where accuracy is essential.

Project Dissemination:

B. Brown, J., Stubblefield, G., Yates, J., Cornelius, M., Leonard, M., Westwood, C., & Corso, G. M. (2024, March). *Divergent creative problem-solving in the context of working memory and field dependence/independence.* Poster Presentation, Southwestern Psychological Association Annual Meeting, San Antonio, TX.
   - Also presented at the Celebration of Student Scholarship, Morehead, KY. (2024, April).

C. Stubblefield, G., Brown, J., Yates, J., Cornelius, M., Leonard, M., Westwood, C., & Corso, G. M. (2024, March). *Convergent creative problem-solving in the context of working memory and field*

dependence/independence. Poster Presentation, Southwestern Psychological Association Annual Meeting, San Antonio, TX.
    - Poster presentation at the Annual Meeting of Posters at the Capitol, Frankfort, KY. (2024, March)
    - Also presented at the Celebration of Student Scholarship, Morehead, KY. (2024, April).

D. Cornelius, M., Leonard, M., Westwood, C., Brown, J., Stubblefield, G., Yates, J., & Corso, G. M. (2024, March). *The effect of colored noise on recall accuracy, study time, and latency.* Poster Presentation, Southwestern Psychological Association Annual Meeting, San Antonio, TX.
    - Also presented at the Celebration of Student Scholarship, Morehead, KY. (2024, April).

E. Leonard, M., Westwood, C., Cornelius, M., Brown, J., Stubblefield, G., Yates, J., & Corso, G. M. (2024, March). *The relationship between attitudes about colored noise and annoyance or helpfulness ratings.* Poster Presentation, Southwestern Psychological Association Annual Meeting, San Antonio, TX.
    - Also presented at the Celebration of Student Scholarship, Morehead, KY. (2024, April).

F. Yates, J., Brown, J., Cornelius, M., Stubblefield, G., Leonard, M., Westwood, C., & Corso, G. M. (2024, March). *Recognition accuracy for 2-dimensional shapes differing in presentation angle.* Poster Presentation, Southwestern Psychological Association Annual Meeting, San Antonio, TX.

G. Westwood, C., Brown, J., Cornelius, M., Stubblefield, G., Leonard, M., Yates, J., & Corso, G. M. (2024, March). *Recall task performance under different wavelengths of light.* Poster Presentation, Southwestern Psychological Association Annual Meeting, San Antonio, TX.

Awards and/or Honors: N/A

Post-Graduation Plans (Seniors Only): N/A

Klausnitzer, Timo

Major: Neuroscience

Faculty Mentor: Illsun White

Research/Project Title: NMDA-Muscarinic receptor interaction in Learning and Memory

Project Abstract/Summary: Fall 2023: Timo's research focused on drug abuse, focusing on opiate receptor involvement in amphetamine withdrawal in rats.

Spring 2024: Timo worked on neural network research, focusing on aberrant changes in default mode network (DMN) connectivity in major depressive disorder (MDD) and pharmacological treatment in normalizing DMN connectivity. Another research involved challenges of family caregivers in Eastern Kentucky, and their emotional and psychosocial challenges.

Project Dissemination:

Timo M. Klausnitzer and Ilsun M. White (April 2024). Changes in anatomical and functional connectivity in major depressive disorder. Celebration of Student Scholarship, Morehead State University, Morehead, KY.

Timo M. Klausnitzer, Madison Begley, Nicholas Finch, Wesley White, and Ilsun M. White (April 2024). Kentucky Psychological Association (KPA) Conference, Western Kentucky University, Frankfort, KY.

Emma R. Brock, Timo M. Klausnitzer, Wesley White, and Ilsun M (November 2023). Kappa opioid receptor antagonist reduces a sign of acute withdrawal from amphetamine in rats. Celebration of Student Scholarship, Morehead State University, Morehead, KY.

Awards and/or Honors: 2024 Outstanding Neuroscience Junor Award, College of Science
2024 Neuroscience Scholarship Award

Post-Graduation Plans (Seniors Only): Timo's initial direction is to enter graduate programs in Neuroscience. In Spring 2024, Timo's research interests and short-term goal have changed toward Clinical aspects of psychology and neuroscience. Timo worked on research and review, focusing on mood and affect disorders. Timo has completed all core course requirement for Neuroscience major, including the capstone in Spring 2024. As such, he will further sharpen and narrow his short-term goal in Fall 2024.

Yates, Jaden

Major: Psychology/Space Science

Faculty Mentor: Greg Corso

Research/Project Title: A) Divergent creative problem-solving in the context of working memory and field dependence/independence.
B) Convergent creative problem-solving in the context of working memory and field dependence/independence.
C) The effect of colored noise on recall accuracy, study time, and latency.
D) The relationship between attitudes about colored noise and annoyance or helpfulness ratings.
E) Recognition accuracy for 2-dimensional shapes differing in presentation angle.
F) Recall task performance under different wavelengths of light.

Project Abstract/Summary: A) Abstract Problem

Previous research suggests a relationship between working memory capacity (WMC) and field dependence/independence (FDI) and problem-solving performance. The research presented here more closely investigated that relationship by identifying whether problem-solving requiring divergent thinking or convergent thinking is differentially related to measures of working memory and field dependence/independence. A divergent thinking task has multiple solutions and is not restricted by response expectations, whereas a convergent thinking task has one ideal solution. There is an abundance of research on working memory and field independence and its positive relationship to performance on convergent thinking tasks, but the literature is lacking on that relationship relevant to divergent thinking tasks. This investigation incorporated both convergent and divergent thinking tasks as well as measures of WMC (Operation Span or OSPAN) and FDI (Embedded Figures Test or EFT). It was hypothesized that larger working memory capacity and greater field independence should be related to improved performance on divergent thinking tasks. Additionally, a positive relationship between working memory capacity and field independence was hypothesized. The convergent task portion of this study is reported in a different abstract.

Method

All participants completed the OSPAN and EFT to measure WMC and FDI. The OSPAN presents participants with a series of math problems followed by letters which they are instructed to recall at the end of the math series. The EFT measures field dependence/independence by requiring participants to trace target images within complex figures. Participants were randomly assigned to one of two divergent thinking tasks, the Alternative Use Task (AUT) or the Figural Interpretation Quest Task (FIQT). The AUT required participants to identify alternative uses for everyday objects (coffee cup, paperclip, straw) that are different from their typical use. The FIQT required participants to list interpretations of what an ambiguous figure could potentially illustrate. Both the AUT and FIQT were scored using an inter-rater scoring method. Participants were also randomly assigned to one of two convergent thinking tasks.

Results

For each participant (N=46), the OSPAN absolute score (the sum of perfectly recalled letter sets), the EFT score (the number of shapes correctly traced in a 30-second per shape timeframe), the AUT, and the FIQT scores were recorded. Results showed a significant positive correlation between OSPAN and EFT scores, $r(44) = .46$, $p = .001$. This result supports the hypothesized positive relationship between larger Working Memory Capacity and greater Field Independence. Additional results showed a significant positive correlation between scores from the FIQT x OPSAN ($r(21) = .5$, $p = .015$) and scores from the FIQT x EFT ($r(21) = .47$, $p = .024$) but not the scores from the AUT. These results partially support the hypothesis because only a significant correlation between one divergent task, OSPAN, and EFT was observed. Additional analyses are underway.

Conclusion

Implications for this study would suggest greater creative capabilities for individuals with a larger WMC and greater field independence. Greater creative abilities refer to an aptitude for problem-solving that requires “outside of the box” thinking. Additionally, greater creative capabilities are important for school or work-related tasks that require cognitive flexibility.

B) Abstract Problem

The relationship between working memory capacity (WMC), measured with the Operational Span Task, and field dependence/independence (FDI), measured with the Embedded Figures Task, relative to convergent thinking creative problem-solving tasks was investigated. Previous research suggested a

positive relationship between WMC and FDI. However, this relationship is seldom measured; rather, it has been mostly assumed. Additionally, individuals with a larger WMC and greater FI should perform better on convergent thinking tasks; these require an individual to arrive at one ideal and defined solution when presented with a novel problem. Previous research has investigated the relationship between WMC, FDI, and convergent thinking problem-solving tasks and found positive correlations between the three. The current study looked at creative problem-solving tasks requiring convergent thinking, a specific area not thoroughly investigated. Higher WMC and FDI were hypothesized to correlate with increased performance on creative convergent thinking tasks.

Method

At the beginning of the session, various pre-tasks (informed consent, instructions, eye tests) were administered. After completing those tasks, the OSPAN and the EFT were administered. The OPSAN measures working memory capacity by presenting participants with a series of letters followed by a math problem, then requiring participants to recall each letter in order. The EFT measured field dependence/independence by requiring participants to trace target images within complex figures. The Visual Remote Association Task (vRAT), Candle Problem (CP), and Two String Problem (TSP) were used as convergent creative thinking tasks. Participants were randomly assigned to perform the CP/TSP tasks or the vRAT. The vRAT required the identification of a target word that formed compound words with three given words (e.g., given words: scout, friend, flower; target word: girl). The CP required participants to attach a candle to a wall using a matchbox and pushpins. The TSP required participants to tie two strings together using various objects. The strings were hanging from the ceiling and spaced far apart. During each of the three convergent tasks, latency and solution measures were obtained.

Results

The data from undergraduates (n=46) were analyzed. A significant positive correlation between OSPAN and EFT scores, $r(44) = .46$, $p = .001$ was observed, supporting the hypothesis that larger working memory capacity relates to greater field independence. A significant correlation was observed between vRAT and EFT scores, $r(21) = .42$, $p = .044$. This finding partially supports the hypothesis that individuals who are field-independent would perform better on creative problem-solving tasks that require convergent thinking, since a significant correlation with only one of the convergent thinking creative tasks was observed.

Conclusion

Implications suggest that individuals with larger WMC and greater field independence have more advanced convergent thinking capabilities and creative problem-solving abilities. These findings should translate to classroom and work environments to identify individuals with solution-seeking tendencies. Strategies to increase performance in these various settings may be developed and utilized based on our findings.

C) Abstract Problem

Colored noise, noise categorized by color based on frequency and intensity, has been shown to have differential effects on cognitive performance (Söderlund & Sikström, 2008). However, much of the literature investigating the effects of colored noise is limited to white noise and only applies to populations with attention-deficit/ hyperactivity disorder (ADHD). This study investigated a spectrum of colored noises (White, Brown, Pink) on latency and recall accuracy for non-ADHD populations. It was hypothesized that latency, duration of study time, and recall accuracy would be greater for the White-Noise, Brown-Noise, and Pink-Noise conditions than in the No-Noise condition. It was also hypothesized that differences in frequency would result in differences for latency, duration of study time, and recall accuracy across the colored noise conditions.

Method

After signing the informed consent form, undergoing hearing, eye, and colorblindness exams, participants underwent an exposure session to become familiar with the colored noises used in the study. A pre-survey asking about their prior knowledge and uses for the three noises was administered. Next, the participants were assigned to one of four noise conditions. (White-Noise, Brown-Noise, Pink-Noise, or No-Noise). Three separate tasks were used in the study and all participants completed the three tasks. The overall design was a 3 (task) by 4 (noise-condition) mixed design. The three tasks included Task-A memorizing a matrix of two-digit number-object image combinations, Task-B memorizing a matrix of color-noun combinations, and Task-C memorizing a matrix of color-shape combinations. For each task, the

combinations were studied for up to ten-minutes. Then, during the recall an identical matrix without the items to be recalled was presented. For Task-A, the matrix of objects was presented, and participants were required to recall the two-digit number. For Task-B, the matrix of nouns was presented and the color for each item was required to be recalled. For Task-C, the matrix of shapes was presented, and the color associated with each shape was required to be recalled. For all three tasks, an interference task separated the study phase and the recall phase. The interference task required participants to attend to colors of squares presented in a series and indicate whether a given color had appeared in the series. Task-A, Task-B, and Task-C were sequential, but the order was randomized. After completing the tasks, participants were administered a post-survey about their opinion of the noise environment.

Results

Undergraduate students (n = 73) participated for class credit. Dependent variables included recall accuracy, duration of study time, and latency of recall. Several derived variables, based on the dependent variables, were subjected to analysis of variance. However, the analysis resulted in no significant differences among noise conditions or for the derived measures. Likewise, there were no significant differences for the original dependent measures.

Conclusion

Our initial hypotheses suggesting that colored noise had effects on accuracy or latency were not supported. Personal preference and the specific task may play a role in the effectiveness of colored noise. Further investigation of individual differences and utilization of more diverse tasks may be beneficial.

D) Abstract Problem

Across various media, there are suggestions that different color noises, defined by differences in the frequency spectrum of the sound, may benefit different mental conditions. This study analyzed participant attitudes about colored noise after task completion. It was hypothesized that participants who reported experience with the effective use of colored noise in the pre-survey would rate the noises presented in this study as lower in annoyance and higher in helpfulness in the post-survey than participants without previous experience with the noises. Additionally, it was expected that the helpfulness and annoyance levels would be different for the different color noises.

Method

Four different colored noise conditions: White-Noise, Brown-Noise, Pink-Noise, and No-Noise were used. Participants (n = 73) were randomly assigned to one of the four noise conditions. All participants completed an exposure task. During the task, participants listened to the three colored noises and were asked to identify each as they were presented. Participants then completed a self-report pre-task survey to determine familiarity and prior use of the colored noises. They were asked to (A) identify if they had previously encountered any of the three noises; (B) if they had used any of the three noises; and, (C) if the noise was effective. Three different memory tasks were within-subject variables. The tasks are described, and the performance results are presented in another abstract. A self-report post-task survey was administered to the participants (n = 57) in the three noise groups (White, Brown, and Pink). The survey asked about the helpfulness and annoyance of the noise. Two separate five-point Likert scales were used. One scale was concerned with the Helpfulness of the noise, with a “1” rating being least helpful and a “5” rating being most helpful. The other rating scale was concerned with the Annoyance of the noise, with a “1” rating indicating that the noise was least annoying and a “5” rating indicating that the noise was most annoying. Also asked was why they chose their rating. The post-task survey was not administered to participants assigned to the no-noise condition because there was no noise to induce annoyance or helpfulness.

Results

There was a significant negative correlation between Helpfulness ratings and Annoyance ratings. [$r(55) = -0.51$, $p < .001$]. No significant correlations existed between Reported Previous Use Effectiveness and Helpfulness/Annoyance ratings.

Conclusion

The overall finding of this study is that if the colored noise is annoying, its helpfulness decreases. Since no significant correlation was found between reported previous use effectiveness and helpfulness/annoyance, we can suggest that prior use of colored noise does not affect helpfulness for future uses. It should also be

noted that incorporating color noise in different tasks might result in different levels of annoyance and helpfulness.

E) Abstract Problem

The proposed research investigates shape recognition as the presentation angle of 2-Dimensional shapes change. Some shape rotation tasks require participants to initiate rotation of a shape until it is congruent with the angle of a target shape. Research manipulating whole shapes in a continuous rotation situation has been investigated. Lacking in the literature is recognition performance data for 2-dimensional targets when presentation angle changes appear to be lacking. Additionally, information about aphantasia within participant samples appears to be lacking. We are seeking feedback about the proposed methods.

Method

We believe a signal detection paradigm might be the best way to proceed, but we are seeking feedback on this approach. Being considered are 2-dimensional shapes including square, circle, rectangle, triangle, oval, and star. Additionally, the angle of x-axis rotation will range from 0 degrees rotation to 90 degrees rotation in 2-degree steps. At the start of the trial a target will be presented. The target will be a shape presented at 90 degrees from the horizon so it will be able to be clearly recognized. To use a signal detection paradigm, a signal trial and a noise need to be constructed. The signal trial could be all the shapes minus one shape presented simultaneously, with the noise trial being all shapes except the target trial. We would present 25 target trials and 25 noise trials and hold the presentation angle constant for all 50 trials. For trials 51 to 100 a randomly selected presentation angle would be selected and used for the same target. This procedure will continue until all shapes and all angles are presented. Using 45 angles with 50 signal/noise trials results in 2250 trials for one shape. For six shapes 13,500 trials would be required. The response would be target present or target not present. We do not think this approach is doable. A different approach and at the other extreme, would be to present the target shape at different presentation angles in an ascending and descending manner – stopping when participant says yes, it is the target, or no, it is not the target. There would be no noise items and each target shape would be presented alone. If we used 5 ascending angle trials, starting from 0-degrees and increasing by 2-degrees after each response until 90-degrees was reached) and 5 descending angle trials that would result in a maximum of 450 trials per shape. Shape would be a between-subject variables with 10 participants per shape. However, if different recognition angles for the different shapes occur, group differences may be the cause and not object differences. Using the second approach, catch trials for each shape and angle would have to be used within the series. A Vividness of Visual Imagery Questionnaire will be administered to assess aphantasia.

Results

Psychophysical plots will be constructed, and threshold or mean d' and Beta values will be computed.

Conclusion

These results could fill a void in the perceptual literature, and they might be useful in reducing shape recognition errors in augmented displays.

F)Abstract Problem

People often use different colors of light for different tasks. Different wavelengths of light therapy are used for treatments such as pain relief (Martin et al., 2022). Light therapy is also used as a possible method of treating seasonal affective disorder (Oren et al., 1991; Strong et al., 2009). There is also evidence that light therapy can improve cognition in elderly participants (Royer et al., 2012). However, there is little research on how different wavelengths of light affect memory tasks. This proposed study seeks to investigate performance on recall tasks under different wavelengths of light. Red, Green, Blue, and White are proposed light conditions as a between-subject variable. We hypothesize that different emotions may be invoked in the different wavelengths of light, and therefore, we suspect there will be significant differences in recall performance across different light conditions.

Method

While participants are being color light-adapted, the participants (minimum of 32) will be asked about their use of colored lights on a pre-survey. In the color light adapted situation, the participants will complete a practice recall task and a Jenga task in the remaining adaptation period. Memory tasks will begin after about 20 minutes in the color-adapted situation. Four lists will be used for the memory tasks – each list will contain ten items of four-letter words, eight-letter words, two-digit numbers, or three-digit numbers. The

computer will read the first randomly assigned list to the participant. Stimulus onset asynchrony interval and duration for the time between presentation and recall will be determined by a pilot study. The participant will then complete a distraction task: playing Jenga. When a cue to recall is presented, the participant must recall the items as quickly as possible. There is no recall time limit, but the total time to recall will be recorded. The next list requiring study will be presented at the end of the recall period. A pilot study will determine the interval between the end of the recall period and the beginning of the next study period. The same procedure will be followed for the remaining three recall task lists. A post-survey will ask the participant to rate the light condition on a five-point Likert scale for annoyance, helpfulness, and distractibility. The post-survey will also ask participants to indicate their current mood from the light and why.

Results

The percent correct for each task will be subjected to an ANOVA with light color as the grouping variable and the four tasks as a within-subject variable. Also analyzed will be the ratings from the three scales.

Conclusion

Implications for the expected findings would suggest alternative environments in which to study for assessments and exams. Listening to lectures in different lighting is a practical implication for the possible findings of this study. The findings of significant differences between the color light groups might play a role in situations where accuracy is essential.

Project Dissemination:

C. Brown, J., Stubblefield, G., Yates, J., Cornelius, M., Leonard, M., Westwood, C., & Corso, G. M. (2024, March). *Divergent creative problem-solving in the context of working memory and field dependence/independence.* Poster Presentation, Southwestern Psychological Association Annual Meeting, San Antonio, TX.
   - Also presented at the Celebration of Student Scholarship, Morehead, KY. (2024, April).

D. Stubblefield, G., Brown, J., Yates, J., Cornelius, M., Leonard, M., Westwood, C., & Corso, G. M. (2024, March). *Convergent creative problem-solving in the context of working memory and field dependence/independence*. Poster Presentation, Southwestern Psychological Association Annual Meeting, San Antonio, TX.
   - Poster presentation at the Annual Meeting of Posters at the Capitol, Frankfort, KY. (2024, March)
   - Also presented at the Celebration of Student Scholarship, Morehead, KY. (2024, April).

E. Cornelius, M., Leonard, M., Westwood, C., Brown, J., Stubblefield, G., Yates, J., & Corso, G. M. (2024, March). *The effect of colored noise on recall accuracy, study time, and latency.* Poster Presentation, Southwestern Psychological Association Annual Meeting, San Antonio, TX.
   - Also presented at the Celebration of Student Scholarship, Morehead, KY. (2024, April).

F. Leonard, M., Westwood, C., Cornelius, M., Brown, J., Stubblefield, G., Yates, J., & Corso, G. M. (2024, March). *The relationship between attitudes about colored noise and annoyance or helpfulness ratings.* Poster Presentation, Southwestern Psychological Association Annual Meeting, San Antonio, TX.
   - Also presented at the Celebration of Student Scholarship, Morehead, KY. (2024, April).

G. Yates, J., Brown, J., Cornelius, M., Stubblefield, G., Leonard, M., Westwood, C., & Corso, G. M. (2024, March). *Recognition accuracy for 2-dimensional shapes differing in presentation angle.* Poster Presentation, Southwestern Psychological Association Annual Meeting, San Antonio, TX.

H. Westwood, C., Brown, J., Cornelius, M., Stubblefield, G., Leonard, M., Yates, J., & Corso, G. M. (2024, March). *Recall task performance under different wavelengths of light.* Poster Presentation, Southwestern Psychological Association Annual Meeting, San Antonio, TX.

Awards and/or Honors: N/A

Post-Graduation Plans (Seniors Only): M.S. Space Science & Engineering

Elmer R. Smith College of Business & Technology

School of Business Administration

Castro, Jose Garcia

Major: Sport Management
Faculty Mentor: Steve Chen
Research/Project Title: A LinkedIn Analysis: Job Placement for Students in Sport Management Program of An Eastern Kentucky Public University
Project Abstract/Summary: In addition to standardized tests and program assessments of academic programs, tracking college alums' employment is also deemed an effective method for measuring student learning and success. In this case study, the authors examined 251 students' LinkedIn profiles by using main keywords such as the name of the institution and sport management to gather information about current employment status, degree of program completion, and primary self-identified skills of observed individuals. The results indicated that about 72.3% of 347 graduates (n = 251) from 2007 to 2022 had a completed profile and job employment. However, only about 37% held a sport-related job. Organizing skills, creativity, teamwork, problem-solving, flexibility, leadership, collaboration, and communication were the top self-perceived job skills among the observed students. Those identified job skills also coincided with the primary skills for job success suggested by numerous studies (Chen et al., 2017; Kyllonen, 2013; Lazarus, 2019; Mitchell et al., 2010; Oussii & Klibi, 2017). Sport Management graduates may not necessarily hold sport-related jobs; however, they remain competitive in the job market as long as they self-reported the essential job skills on their profiles. The primary recommendation for the future students is to create a LinkedIn profile early so they can be identified by the talent researchers and expand the chance for securing internships and practicums.
Project Dissemination: 2023 Posters-at-the-Capitol
2023 Annual Celebration of Student Scholarship
Awards and/or Honors: N/A
Post-Graduation Plans (Seniors Only): Hired by Unrival Sports

Isley, Peighton
Major: Legal Studies
Faculty Mentor: Lucas Lunt
Research/Project Title: What's in a name? A case study of NIL opportunities as a form of marketing promotion
Project Abstract/Summary: This undergraduate research project is a case study that describes a marketing promotion opportunity involving Dale Sebastian, the Chief Marketing Officer at a large law firm in Texas. The three opportunities he is presented with primarily include sponsorship of college football athletes at a Power 5 university in Texas through usage of the recently passed Name, Image, and Likeness (NIL) laws in collegiate athletics. A background of this transition to the NIL era of collegiate athletics, including the evolving legal landscape, major public NIL deals, and implications of this transition are provided. The reader (student) is asked to formulate recommendations for Dale about the marketing promotion opportunities that account for the resource outlay required and expected benefits received from each opportunity. The suggested audience for this case study will be upper-level undergraduate and graduate students.
Project Dissemination: Poster at Celebration of Student Scholarship
Awards and/or Honors: N/A
Post-Graduation Plans (Seniors Only): N/A

Palmer, Landon
Major: Sport Management
Faculty Mentor: Steve Chen
Research/Project Title: Athletic Recruitment Analysis in Higher Education
Project Abstract/Summary: The project, looked into the complex landscape of athletic recruitment within higher education institutions, aiming to provide insights that can enhance the recruitment process for student-athletes and optimize opportunities for both athletes and academic institutions.
By examining the current state of athletic recruitment practices, exploring the methods, challenges, and outcomes associated with recruiting student-athletes across different sports and academic institutions. Through comprehensive data analysis and qualitative research methods, to identify patterns, trends, and

disparities in the recruitment process, including factors such as demographics, athletic performance metrics, academic achievements, and socioeconomic backgrounds.

Since athletic programs are often viewed as the front porch of the higher education institutions, recruiting talented student-athletes is a vital and challenging task under the unreasonable demand of high performance, limited and decreasing budget, and dwindling student enrollment. Additionally, the increasing use of *Name, Image, and Likeness* (NIL) deals and transfer portal across the nation have made administrators and coaches worried about their effect on recruitment and program retention. These practices make the recruiting process even more competitive. Through the responses of 106 student-athletes of a regional state university in Eastern Kentucky, the researchers identified respondents' perception concerning these newly introduced practices, and key elements for searching an ideal institution and deciding to enroll. More than 60% of the respondents selected their destination from three to four choices. Over 94% of individuals were satisfied with their enrollment decision. Although the NIL deals might be an enticing factor to impact respondents' enrollment decision, financial affordability, relationship with the university's coaching staff, and location were still more important determinants for making enrollment choices. Respondents' understanding of institution's information were heavily relied on word-of-mouth communication and internet search. The findings of the project have direct implications on how athletic departments should focus on relationship-building and online advertising to interact with potential recruits. These practices may attract a lot of media attention, they should not drastically change the recruiting landscape and fundamental practices of recruiting.

Project Dissemination: Posters-at-the-Capitol
Annual Celebration of Student Scholarship

Awards and/or Honors: Merit Poster Presentation at the Annual Celebration of Student Scholarship

Post-Graduation Plans (Seniors Only): Currently interning with MSU Women's basketball

Ernst & Sara Lane Volgenau College of Education

Early Childhood, Elementary, & Special Education

Akers, Gwendolyn

Major: English Education

Faculty Mentor: Rebecca Roach

Research/Project Title: Appalachian Voices in the Classroom

Project Abstract/Summary: As educators, it is important that we recognize the types of literature that are present in our schools, and how the literature that is taught can affect our students and their education. Utilizing a survey method, we collected data from elementary, middle, and high school teachers within the service region of MSU regarding the prevalence of Appalachian literature in their classrooms and in their schools. Teachers were asked whether they determined the usage of Appalachian Literature in the classroom important and whether the teaching of these "authentic" Appalachian voices helped their students in both their studies and their confidence. The conclusions from this study may help to unveil and promote the vital nature of teaching Appalachian literature in the classroom, as well as create a book list to guide teachers in the selection of this literature.

Project Dissemination: Oral Presentation at Celebration of Student Scholarship in Morehead, Kentucky

Awards and/or Honors: Oral Presentation Exceptional Merit Certificate, Celebration of Student Scholarship

Post-Graduation Plans (Seniors Only): N/A

Leibee, Tessa

Major: Secondary Education

Faculty Mentor: Andrea Wells

Research/Project Title: Knowledge-Based Curricula and Its Impact on Learning

Project Abstract/Summary: This project aims to investigate the effectiveness of E.D. Hirsch, Jr.'s Core Knowledge Foundation curriculum and the research presented in his many books, including Why Knowledge Matters, The Knowledge Deficit, Cultural Literacy, The Making of Americans, The Schoos We

Need and Why We Don't Have Them, as well as Thomas Sowell's Inside American Education. The study will examine the impact of the Core Knowledge Foundation's curriculum on student achievement in schools that have implemented it, compared to those that have not. The study will also explore the relationship between the knowledge-based curriculum and its potential to improve student outcomes.
Project Dissemination: N/A
Awards and/or Honors: N/A
Post-Graduation Plans: N/A

Miller, Sarah

Major: Elementary Education
Faculty Mentor: Kimberely Nettleton
Research/Project Title: Classroom Managed: Teaching and Behavior Management Strategies Implemented in Eastern Kentucky Schools
Project Abstract/Summary: Classroom management is the number one problem area identified for first year teachers. As teachers gained experience, they developed skills in this area. In the post-Covid classroom, experienced teachers are re-examining old behavior models and classroom methods. Through interviews and observations, this study will examine the changes that the post-Covid school has made to on classroom management.
Project Dissemination: Oral Presentation
Miller, Sarah G. and Nettleton, K.F. (2024). *Teaching and Behavior Management Strategies Implemented in Eastern Kentucky Schools*, Celebration of Student Scholarship, Morehead, KY, April 2024.
Accepted: Poster presentation: NCUR April 2024
Awards and/or Honors: N/A
Post-Graduation Plans (Seniors Only): N/A

Foundational & Graduate Studies in Education

Caudill, Caroline

Major: Middle Grades Education
Faculty Mentor: Jeannie Justice
Research/Project Title: Teaching Low-Socioeconomic Rural Appalachian Kids: Haldeman Community Center After School Program
Project Abstract/Summary: Essentially this is a two-fold action research project where students collect data annually, running analyses to determine conclusions, but also looking at the data longitudinally, over years, to see if there are long term trends. Each MSU student (URFs) work on a specific type of lesson based on research about the population (i.e., low socioeconomic, Appalachian, rural) to create a lesson. The students have determined to look specifically at kinesthetic lessons where students learn with movement or hands-on doing. As the URFs do the lesson (they work together), the mentor collects the observational data. Essentially the type of instruction at the time (i.e., audio, visual, kinesthetic) and how many students are engaged and how many students are off track. From the collected data, we used a F Test to determine which t-test should be used. When comparing kinesthetic to non-kinesthetic, we found there was a significant difference in how many students were engaged. Students were more engaged with kinesthetic lessons. This was the second year of the project, so we compared the first year's data to the second year. We found no significant changes, meaning for the second year in a row, we found that there was more engaged students with kinesthetic lessons. The URFs are trying to incorporate more kinesthetic learning in their lessons. They've also learned how to replicate this process when they are teachers and want to try something new in their own classroom. They can now do an action research project to determine if the new addition is actually helpful.
Project Dissemination: Annual Celebration of Student Scholarship
Awards and/or Honors: Merit winner at Annual Celebration of Student Scholarship
Post-Graduation Plans (Seniors Only): N/A

Crase, Morgan

Major: English

Faculty Mentor: Timothy Simpson
Research/Project Title: Identification and Moral Formation through Children's Literature
Project Abstract/Summary: With this research project, I would like to explore what qualities of a story make it successful in the world of children's literature (specifically for grades K-8). I am curious as to what storytelling devices are most effective in the moral formation of a young reader, and what elements of a story intrigue a child. After identifying the components of an effective, entertaining, and educative children's story, I hope to have a better understanding of why children become attached to certain stories or characters within a story, and why values taught in children's books are often implemented into a child's identity. To identify the effective and entertaining elements in a story, I would like to explore the works of some of the most successful authors of children's literature such as C.S. Lewis and J.R.R. Tolkien. I will also be consulting the works of various professionals in the field, such as Vigen Guroian and William Kilpatrick. By the end of this project, I would like to explain why certain children's stories are successful in educating and entertaining a child and how those stories assist in the child's moral formation.
Project Dissemination: N/A
Awards and/or Honors: N/A
Post-Graduation Plans (Seniors Only): N/A

Oliver, Laurabeth
Major: Middle Grades Education
Faculty Mentor: Jeannie Justice
Research/Project Title: Teaching Low-Socioeconomic Rural Appalachian Kids: Haldeman Community Center After School Program
Project Abstract/Summary: Essentially this is a two-fold action research project where students collect data annually, running analyses to determine conclusions, but also looking at the data longitudinally, over years, to see if there are long term trends. Each MSU student (URFs) work on a specific type of lesson based on research about the population (i.e., low socioeconomic, Appalachian, rural) to create a lesson. The students have determined to look specifically at kinesthetic lessons where students learn with movement or hands-on doing. As the URFs do the lesson (they work together), the mentor collects the observational data. Essentially the type of instruction at the time (i.e., audio, visual, kinesthetic) and how many students are engaged and how many students are off track. From the collected data, we used a F Test to determine which t-test should be used. When comparing kinesthetic to non-kinesthetic, we found there was a significant difference in how many students were engaged. Students were more engaged with kinesthetic lessons. This was the second year of the project, so we compared the first year's data to the second year. We found no significant changes, meaning for the second year in a row, we found that there was more engaged students with kinesthetic lessons. The URFs are trying to incorporate more kinesthetic learning in their lessons. They've also learned how to replicate this process when they are teachers and want to try something new in their own classroom. They can now do an action research project to determine if the new addition is actually helpful.
Project Dissemination: Annual Celebration of Student Scholarship
Awards and/or Honors: Merit winner at Annual Celebration of Student Scholarship
Post-Graduation Plans (Seniors Only): N/A

Woosley, Madison
Major: Middle Grades Education
Faculty Mentor: Jeannie Justice
Research/Project Title: Teaching Low-Socioeconomic Rural Appalachian Kids: Haldeman Community Center After School Program
Project Abstract/Summary: Essentially this is a two-fold action research project where students collect data annually, running analyses to determine conclusions, but also looking at the data longitudinally, over years, to see if there are long term trends. Each MSU student (URFs) work on a specific type of lesson based on research about the population (i.e., low socioeconomic, Appalachian, rural) to create a lesson. The students have determined to look specifically at kinesthetic lessons where students learn with movement or hands-on doing. As the URFs do the lesson (they work together), the mentor collects the observational

data. Essentially the type of instruction at the time (i.e., audio, visual, kinesthetic) and how many students are engaged and how many students are off track. From the collected data, we used a F Test to determine which t-test should be used. When comparing kinesthetic to non-kinesthetic, we found there was a significant difference in how many students were engaged. Students were more engaged with kinesthetic lessons. This was the second year of the project, so we compared the first year's data to the second year. We found no significant changes, meaning for the second year in a row, we found that there was more engaged students with kinesthetic lessons. The URFs are trying to incorporate more kinesthetic learning in their lessons. They've also learned how to replicate this process when they are teachers and want to try something new in their own classroom. They can now do an action research project to determine if the new addition is actually helpful.

Project Dissemination: Annual Celebration of Student Scholarship

Awards and/or Honors: Merit winner at Annual Celebration of Student Scholarship

Post-Graduation Plans (Seniors Only): N/A

Index