28th Annual

Student Scholars Day

April 10, 2024

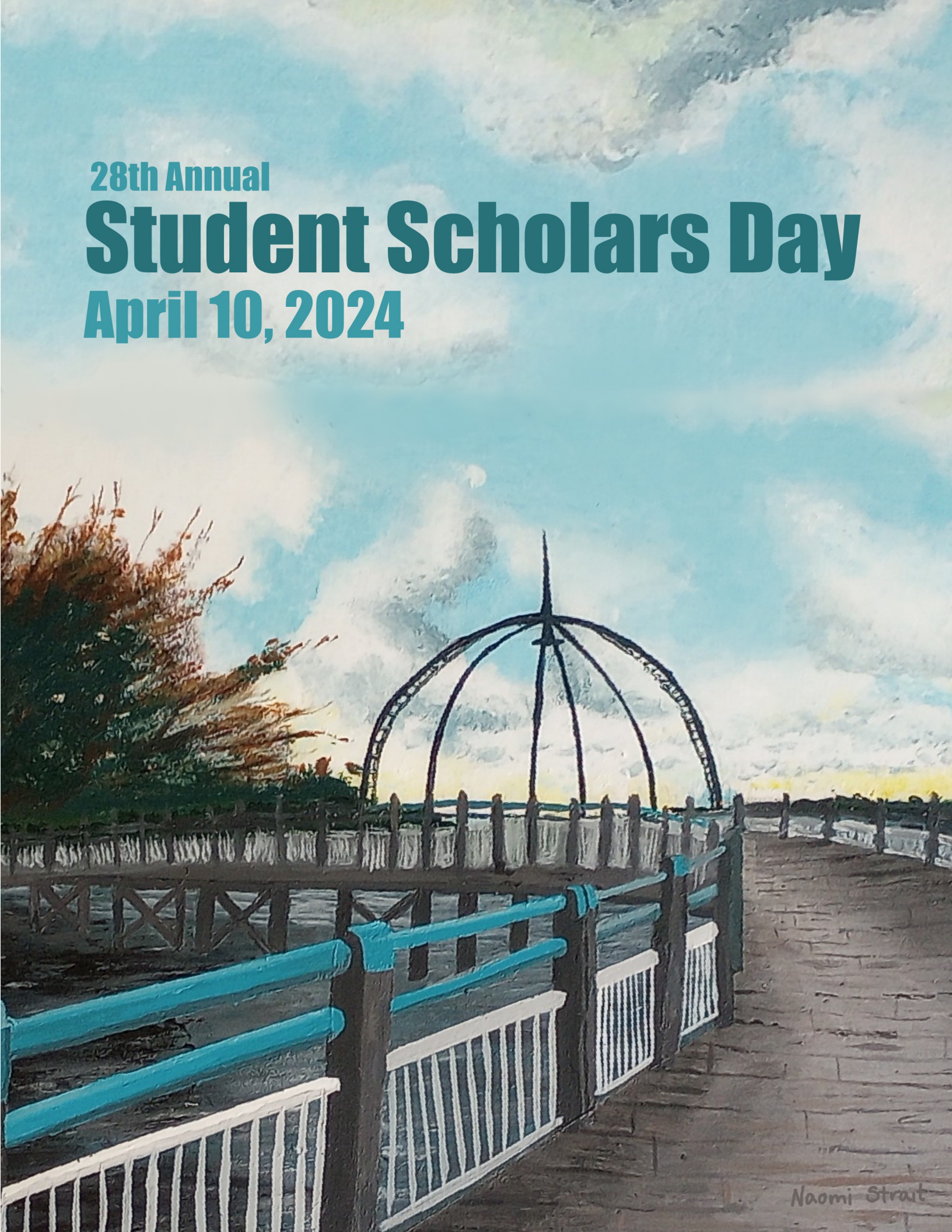

Table of Contents

SSD Committee

Feryal Alayont	Mathematics
Rene Ardila	Mathematics
Andrew Lantz	Chemistry
Susan Mendoza	Center for Undergraduate Scholar Engagement
Debbie Morrow	Library (SSD Committee member emerita)
Ross Reynolds	Physics (SSD Committee member emeritus)
Michael Scantlebury	Hospitality and Tourism Management
Courtney Sherwood	Center for Undergraduate Scholar Engagement
Shelley Sickrey	Center for Scholarly and Creative Excellence
Kaity Soholt	Office of Undergraduate Research and Scholarship
Richard Vallery	Physics
Glenn Valdez	Psychology

Schedule of Events

Live Presentations
9:00 AM - 5:00 PM.
See page 10 for detailed schedule and abstracts.

Recorded Presentations
Available on April 10, 2024
See page 115 for abstracts.

SSD Keynote Speaker
April 9, 4:00 PM
See page 6 for detailed schedule.

SSD and the Visual Arts at GVSU: Art Reception
April 11, 5:00 PM
Calder Art Center

Exhibitions of Art
April 10 - 28, 2023
See page 7 for details.

Statement from the Cover Artist

Naomi Strait

This is my first year participating in Student Scholars Day. With this cover, I wanted to show a facet of home. I chose a place dear to me, while not literal home, it is a home in a sense to me. It may be complicated to find a place to rest, but places such as Heritage Landing are home to me.

History of Student Scholars Day

by Neal Rogness and Shelley Sickrey

In the summer of 1995, a small group of faculty members in the Science and Mathematics Division met to explore the feasibility of creating an event where students could present their findings from faculty-mentored research to a university-wide audience. P. Douglas Kindschi, Dean of Science and Mathematics, was enthusiastically supportive, thus Student Research Day (SRD) was born.

It was decided to hold the event on April 12, 1996, in conjunction with the dedication and celebration of the new Seymour and Esther Padnos Hall of Science. The first-time event was expected to draw about thirty student participants. All expectations were exceeded when the registration period ended with over 150 presenters committed to present almost 100 presentations. The first event was a tremendous success; however, it was unknown whether SRD could be a successful “stand alone” event. These fears were quickly allayed when the second annual Student Research Day was held in April of 1997 and proved to be a great success with a similar level of participation. The event became popular enough to get requests from students outside of science and mathematics majors who wanted to present their work. An effort began to make the event truly university-wide, which then Provost Glenn Niemeyer whole-heartedly supported.

Students from all majors were encouraged to present and/or exhibit their faculty-mentored scholarly work at the event. To help make the event more inclusive, its name was changed from Student Research Day to Student Scholarship Day. The first university-wide event doubled in size with nearly 300 students giving almost 200 presentations in 1998. The first SSD keynote speaker was Dr. Robert Powell, Professor of Biology at Avila College, who talked about “Student/Faculty Collaboration: Teaching and Scholarship.” Another name change occurred in the Fall of 2009, this time to Student Scholars Day. The name change was instituted to combat occasional confusion over the nature of the event. “It’s still very focused on student work, but the new name takes away any ambiguity about what the purpose of the day is,” said Susan Mendoza, Director, Center for Undergraduate Scholar Engagement.

What began as an event primarily composed of science and mathematics majors has grown to include student presentations representing majors from across the university. The GVSU community has truly embraced this annual event as a day in which to take pause and proudly celebrate the scholarly achievements of students from the past year. Student Scholars Day continues to grow, both in size and scope. The event continues to encompass interdisciplinary relationships among the presentations. Individually, the presentation is clear and focused. Taken as a whole, a larger, more inclusive picture of collaboration and learning emerges.

History of Undergraduate Research and Scholarship at GVSU

The pursuit of student research and scholarship at Grand Valley has deep roots in the history of the university. Original student research began in a number of the original Colleges at GVSU, namely Thomas Jefferson College, William James College, and the College of Arts and Science. This tradition continued through decades as the university grew.

Student Scholars Day (SSD) and Student Summer Scholars (S3), originally established in the Division of Math and Science, have served as the anchors for undergraduate research for over twenty years. These programs have served thousands of students by encouraging original research and scholarship.

SSD and S3 moved to the Brooks College of Interdisciplinary Studies and became part of the Office of Integrative Learning in 2006. During this time, both programs were expanded to support student research from all disciplines and majors.

In 2010, the Office of Undergraduate Research and Scholarship (OURS) was established as part of the Center for Scholarly and Creative Excellence. The mission and intent of the office is to establish comprehensive services and programs which support students in their pursuit of inquiry, creativity, scholarship, and research. In addition to Student Scholars Day, the programs of OURS include:

Scholar & Fellowship Programs

Alayont Undergraduate Research Fellowship in Mathematics
GVSU Library Scholars Summer Program
P. Douglas Kindschi Undergraduate Research Fellowship in the Sciences
Student Summer Scholars (S3) / Modified Student Summer Scholars (MS3)

Research Support & Recognition

Academic Conference Fund (ACF)
Academic and Professional Enrichment Fund (APEF)
OURS Project Supplies Grant
GVSU Undergraduate Research/Creative Scholar Transcript Designation
Undergraduate Research Assistants Program (URA)

Outreach Programs & Events

Chalk Art Symposium
OURS Ambassadors
Summer Research Orientation
Undergraduate Research Fair

SSD Speaker Series

SSD Speaker Series
Keynote Speaker: Imani Perry
Tuesday, April 9, 2024, 4:00 p.m.
Kirkhof Center, Allendale Campus

Born just nine years after the 16 th Street Baptist Church bombing in Birmingham, Alabama, MacArthur “Genius Grant” Fellow Imani Perry was instilled from an early age with a strong instinct for justice and progressive change. The rich interplay between history, race, law, and culture continues to inform her work as a critically-acclaimed author and professor of studies of women, gender and sexuality and of African and African American studies at Harvard University.

Perry’s work reflects the deeply complex history of Black thought, art, and imagination. It is also informed by her background as a legal historian and her understanding of the racial inequality embedded in American law. Her latest book, National Book Award-winner South to America: A Journey Below the Mason Dixon to Understand the Soul of a Nation, is a narrative journey through the American South, positioning it as the heart of the American experiment for better and worse. In looking at the South through a historic, personal, and anecdotal lens, Perry asserts that if we do indeed want to build a more humane future for the United States, we must center our concern below the Mason-Dixon Line.
South to America was named a best book of 2022 by the New Yorker, Time, Kirkus, and Oprah Daily, and longlisted for the 2023 PEN/John Kenneth Galbraith Award for Nonfiction.

Student Ambassador Panel: Employer Preview
Wednesday, April 10, 2024, 11:30 a.m.
Kirkhof Center, Allendale Campus

The GVSU Career Center and the Office of Undergraduate Research and Scholarship are bringing together students and local employers for a lunch event to showcase the scholarship, research, and creative work performed by GVSU students. During the panel conversation, student ambassadors will share their research and scholarship featured as part of Student Scholars Day. This event gives local employers an opportunity to visit campus, connect with current student researchers, and learn how their work could be of benefit to their organization.

Exhibitions of Art (Apr 10 - 28)

The Visual and Media Arts Department presents student work displayed in the Calder Art Center from April 10 through 28, 2023, with an Artist Reception on Thursday, April 11 at 5:00 PM

Students A-Z:

Sophia Aiello
Art Nouveau Inspired Necklace
Vinyl records, felt, embroidery thread, brass wire, acrylic paint, resin
Mentor: Renee Zettle-Sterling

Madison Alcala
Postage stamp: Aries Moross
Digital Output
Mentor: Vinicius Lima

Lucy Alexander
Illustration
Mentor: Guin Thompson

Rebecca Boerma
National Parks
Ceramics
Mentor: Hoon Lee
&
National Parks
Jewelry & Metalsmithing

Ellina Bolster
Bug Pendant
Bronze, found objects, casting
Mentor: Renee Zettle-Sterling

Collin Christ
The Universal Declaration of Human Rights
Adobe Illustrator/ poster
Mentor: Vinicius Lima

Morgan Davis
Creature Pendant
Cast bronze
Mentor: Renee Zettle-Sterling

Racheal Denton
Jewelry & Metalsmithing
Mentor: Renee Zettle-Sterling

Railyn Eaddy
Where does my food come from
Digital/Figma
Mentor: Vinicius Lima

Isabella Katherine Good
A Clown is A Clown is A Clown
Porcelain, cone 05 low-fire glaze, satin, lace, wire, chain
Mentor: Hoon Lee

Brian Haisma
Slaves to Time
Wood, metal
Mentor: Drew Pettinga

Max Havlik
Dystopian Delivery
Digital print/Adobe Photoshop
Mentor: Guin Thompson

Abby Haywood
Day in the life of a retail worker
Screenprint
Mentor: Guin Thompson

Janiah Mather
Button Box (for mother)
Copper, sterling silver, sterling silver cast buttons
Mentor: Renee Zettle-Sterling

Star McNeal
Home
Digital media
Mentor: Guin Thompson

Caroline Munson
Untitled
Ceramic
Mentor: Hoon Lee

Sophia Nelson
7th
Stoneware, underglaze
Mentor: Hoon Lee

Kelly Nguyen
Mưa Thải Độc - Rain Destroys Poison
Watercolor on paper, printed reproduction
Mentor: Guin Thompson

Jacy Nicols
Untitled
Snow White Stoneware
Mentor: Hoon Lee

Olivia Nolff
Childhood in a Cage
Sterling silver, agate
Mentor: Renee Zettle-Sterling

Destin Nordyke
Gothic Modern
Typeface study, typeface, matte print
Mentor: Vinicius Lima

Kaylee Owens
The Universal Declaration of Human Rights
Adobe Illustrator/ poster
Mentor: Vinicius Lima

Viluth Phimmasouk
I Couldn't Tell You
Bronze, copper, powdercoat
Mentor: Renee Zettle-Sterling

Christy Prater
Gingerbread Reveries
Ceramic, joint compound, wood, acrylic
Mentor: Hoon Lee
&
Layered Authenticity
Wood, joint-compound, acrylic
Mentor: Drew Pettinga

Lauren Radcliffe
The Universal Declaration of Human Rights
Poster, Adobe InDesign
Mentor: Vinicius Lima

Briana Skerpan
The Wild Huntsman
Digital
Mentor: Guin Thompson

Alaina Smith
Moonlit Mausoleum
Brass, copper, silver, moonstone, wood, carved-skulls (animal bone)
Mentor: Renee Zettle-Sterling

Logan Vales
Knights of Gwyn
Digital
Mentor: Guin Thompson

Amelia VanWyck
Eyes of the Lyrical Beholder
Cast bronze and silver, colored pencil, liquid patina
Mentor: Renee Zettle-Sterling

Paige Voss
Jars and Vases
Stoneware clay, snow white clay, high fire glaze
Mentor: Hoon Lee

Claire West
Welcome, Traveler
Wood and stain preserved moss and paper
Mentor: Drew Pettinga

Darby Williams
The Alarm Runs Out Before the Hour
Three-dimensional sculpture/wood
Mentor: Drew Pettinga

Jayce Yakiwchuk
Cage or Sanctuary?
Copper, bronze, sterling silver
Mentor: Renee Zettle-Sterling

In-Person Poster/Portfolio

BEGINNING AT 9:00 AM

HENRY HALL ATRIUM 001

Numerical Solutions to McVittie Timelike Geodesics

Participants attending 11:00 AM - 12:00 PM, 12:00 PM - 1:00 PM
Presenter: Zachary Tyler
Mentor: Brett Bolen

This research provides numerical solutions to timelike geodesics within the Schwarzschild and McVittie metrics. The Schwarzschild metric represents a static, non-spinning black hole. The McVittie metric appears to be Schwarzschild close to the origin, but an expanding FLRW space (cosmology) far away. The main goal of this research is to show the difference in the orbital and gravitational wave patterns between static and expanding spacetimes. Both FLRW and Schwarzschild-DeSitter spacetimes are discussed within the numerical context of calculating geodesics. The numerical method used is an 8th order Runge-Kutta coded using Python.

HENRY HALL ATRIUM 002

An Ongoing Literature Review Examining the Habituation Paradigm and Developmental Disabilities

Participants attending 11:00 AM - 12:00 PM
Presenter: Emily Radenbaugh
Mentor: Naomi Aldrich

The current investigation is an ongoing literature review examining the extent to which the habituation paradigm has been utilized in past research involving individuals with developmental disabilities. The habituation paradigm is a research procedure developed in the 1930s primarily to investigate infant perception and information processing. To date, three databases (PsycInfo, PEDro, PubMed) were searched using the following keywords: developmental disabilities, habituation, habituation paradigm. A total of 31peer-reviewed articles and one book were initially identified as potentially using the habituation paradigm with our population of interest. Upon further reading, we identified 14 that were relevant. Of those few, there was a focus primarily on infants and toddlers, with a small proportion of articles testing older children or adults. The remaining articles identified were: 1) largely unavailable, 2) old articles that contained outdated language, and 3) tested non-human subjects. We plan on continuing our search throughout the remainder of the winter semester in an effort to potentially identify more relevant research relating to this topic. We hope this search can help us to curate a single source for the information on this topic and lead to the creation of a study that targets the key points missing from prior research.

HENRY HALL ATRIUM 003

Determining the Role of ERK1/2 in the Development of Diabetic Cardiomyopathy in Type II Diabetic Mice

Participants attending 10:00 AM - 11:00 AM
Presenter: Erin McLean
Mentor: Ruijie Liu

Diabetes Mellitus is a metabolic disease characterized by chronic hyperglycemia. High glucose levels for a prolonged period can negatively impact many different organs and cause life-threatening damage to the cardiovascular system. In fact, cardiovascular disease is the leading cause of death in the United States, with diabetic cardiomyopathy being a front-runner. Previous research has shown elevated mitogenactivated protein kinases ERK1/2 levels in glucose and lipid metabolism in the heart but their role in diabetic cardiomyopathy is still unknown. In this study, we used U0126 to pharmacologically inhibit ERK1/2 activity in type II diabetic mouse hearts. We administered daily intraperitoneal injections for 5 weeks before analyzing the impact U0126 had on heart weight, ERK1/2 activity, and GLUT4 levels. In conclusion, we simulated type II diabetes using db/db mice and administered daily U0126 injections to determine the role ERK1/2 plays in diabetic cardiomyopathy and to find potential therapeutic treatments for the disease.

HENRY HALL ATRIUM 004

Biochemical Characterization of Class C B-Lactamases in Carbapenem Resistant *Acinetobacter baumanni*

Participants attending 10:00 AM - 11:00 AM
Presenter: Genevieve Palazzolo
Mentor: Rachel Powers

β-lactamases are bacterial enzymes that destroy β-lactam antibiotics, like penicillin, resulting in antibiotic resistance. These enzymes are extremely widespread in clinical settings and cause a significant problem when treating bacterial diseases. Acinetobacter-Derived Cephalosporinases (ADCs) are members of the class C β-lactamases. ADCs are of particular concern due to their resistance to expanded-spectrum cephalosporins. Much of this resistance can be attributed to the acquisition of changes in the amino acid sequence. Specifically, ADC-143, ADC-217, and ADC-218 (which differ by only 1-2 amino acid residues) were prevalently found in carbapenem resistant Acinetobacter baumannii. To better understand their contribution to resistance these enzymes were expressed, purified, and biochemically characterized using X-ray crystallography and kinetics to assess the structure and function of these ADC variants. The crystal structure of ADC-143 provides a three-dimensional picture of the active site of the enzyme, which may help to design molecules to block its activity. Additionally, kinetic analysis of these variants against a panel of penicillins, cephalosporins, and carbapenems will allow for a better understanding of current resistance and may suggest ways to combat this issue. Taken together, these findings will aid our efforts in overcoming antibiotic resistance and disease spread.

HENRY HALL ATRIUM 005

Effects of the Mediterranean Diet and Congestive Heart Failure: A Systematic Review

Participants attending 9:00 AM - 10:00 AM
Presenters: Gage Monroe, Mackenzie Ruba
Mentor: Chad Sutliffe

The objective of this research is to determine the association between the Mediterranean diet and a decreased rate of developing congestive heart failure. Congestive heart failure is a condition in which the heart is no longer pumping blood properly throughout the body and can affect both men and women. One thing that can help prevent mortality rates from congestive heart failure is following a Mediterranean diet. In this systematic review, which included 20 peer reviewed articles that focused on men and women 45 years of age or older. This systematic review revealed that there is a negative correlation between those who had high adherence to the Mediterranean diet and the incidence of congestive heart failure.

HENRY HALL ATRIUM 006

Deletion of Two Regions of the Light-Response BTB Gene in Arabidopsis thaliana

Participants attending 10:00 AM - 11:00 AM
Presenter: Emily Seburn
Mentor: Matthew Christians

The ability to respond to varying intensities and wavelengths of light is crucial for plant development. Red light is detected by the phytochrome photoreceptors. When phytochromes absorb red light, they activate and move into the nucleus, where they regulate gene expression. They are then degraded by LightResponse BTB proteins (LRBs) through the Ubiquitin Proteasome System (UPS). Within the LRB protein sequence, three regions are functionally ambiguous and require further investigation. This experiment aims to elucidate the role of two of those regions. Regions two and three were separately deleted through mutagenesis and then transformed into lrb1-1 lrb2-1 mutants, which contain no functional LRB proteins. We will analyze transformed plants for red light responses and changes to development. Understanding the purpose of regions two and three of the LRB gene will help clarify LRB's role in the degradation of phytochromes and the extent to which it aids in red light signaling.

HENRY HALL ATRIUM 007

Is Remote Work Helpful or Harmful?

Participants attending 2:00 PM - 3:00 PM, 3:00 PM - 4:00 PM, 4:00 PM - 5:00 PM
Presenter: Briana Drazek
Mentor: Benjamin Walsh

In 2020, due to COVID-19, work underwent a transformative shift, becoming increasingly remote, thereby redefining traditional notions of workplace dynamics and productivity. We wanted to examine the implications of working remotely for various indicators of well-being, both on the job-wellbeing (job satisfaction, perceived organizational support), and off-job well-being (anxiety, depression). Anonymized data were collected from 325 participants who reported the percentage of time they worked remotely at Time 1, which was categorized as yes/no. Then at Time 2 (about a week later), they completed validated measures of perceived organizational support, job satisfaction, anxiety, and depression. We tested relationships among variables using point-biserial correlation analysis. Results showed that people who worked remotely were more satisfied with their job and felt more supported by their organizations. Remote workers were not significantly different from office workers in reports of anxiety and depression. It is crucial to dig into what the shift to remote work means for our overall well-being. Understanding this will help us shape better workplace policies moving forward. Ultimately, our results suggest that remote workers experience several benefits in contrast with those who are not able to work remotely. The Great Barrier Reef and other coral reefs from the devastating impacts of climate change.

HENRY HALL ATRIUM 008

Beyond the Red Pen: Investigating the Formation of Reader and Writer Identity Development in Pre-Service Teachers

Participants attending 12:00 PM - 1:00 PM
Presenter: Lydia Denning
Mentors: Pengtong Qu, Sarah Williams

The influence of identifying as a reader and writer and being a literacy teacher has been emphasized in the literature (Graves, 1983). However, few studies explored how teacher education programs develop these identities in pre-service teachers (PSTs). Grounded in Demerath's Epistemological Identity Theory (2006), this study explores the fluid process of teacher identity formation, focusing on nurturing PSTs' identities as readers and writers. The study took place over one semester in an English Education course. The six undergraduate PST participants completed statements about their beliefs regarding teaching/learning literacy. These weekly reflections revolved around topics that aligned with literacy theories they studied, book discussions, and writing they engaged in. We used Gee's (1999) definition of discourse which regards them as "situated identities" (p. 13) and adopted Alsup's (2006) borderland discourse analysis to explore PST's discourses in the "cross-over" between student and teacher discourse. The findings suggested that PSTs benefited from the opportunity to engage with reading and writing materials at their level (e.g. adult books), which provided them with a more sophisticated understanding of literacy, enhanced their literacy skills, deepened their appreciation for reading and writing, and for some participants, influenced them to begin identifying themselves as readers/writers.

HENRY HALL ATRIUM 009

Learning From the Literature: Supporting Nursing Student Academic Success

Participants attending 10:00 AM - 11:00 AM
Presenter: Maria Mauer
Mentor: Janet Winter

The nursing profession is committed to providing high-quality healthcare to diverse populations and recognizes that diversity within the profession is essential for delivering culturally competent care (AACN, 2023). However, underrepresented nursing students face unique challenges in their pursuit of education (Johannessen, et al., 2022). Ensuring student retention and success in post-licensure nursing programs remains a priority. Previous literature searches have identified barriers to academic success among nursing students, especially those who self-identify as economically or educationally disadvantaged, or of underrepresented ethnic minority (UREM) groups. In 2021, KCON conducted an extensive literature search to better understand possible elements of wraparound support that would promote academic success in this specific population. This current search builds on literature found in 2021 by posing the question: “In non-traditional post-secondary nursing students from underrepresented or disadvantaged backgrounds, what best support practices are most effective in promoting student retention through to degree completion?” Searches were conducted in Pubmed, CINAL, and Education Source. Preliminary results from this review show that while the wraparound support model is still very applicable, addressing several key areas of its impact may improve its effectiveness and lead to increased student retention and timely degree completion among post-licensure nursing students.

HENRY HALL ATRIUM 010

Shorter generation time may enhance primate resilience to conservation threats

Participants attending 2:00 PM - 3:00 PM
Presenter: Makayla Madsen
Mentor: Cynthia Thompson

Primates face dire conservation challenges due to habitat destruction, rising global temperatures, and illegal poaching. Although anthropogenic factors play a large role in species conservation status, intrinsic biological traits can also influence primates’ resilience to threats. To assess the effect of intrinsic traits impacting reproduction on species resilience, we extracted reproductive data on Neotropical monkeys from published literature and compared these metrics across IUCN conservation status categories. We found that longer gestation lengths and interbirth intervals were significantly associated with more vulnerable conservation status. However, cycle length and birth seasonality did not show a significant relationship with conservation status. Longer interbirth intervals and gestation lengths are indicators of extended generation times, leading to slower reproduction. Although cycle length and birth seasonality are crucial aspects of reproduction, they have less influence on reproductive rate. For Neotropical monkeys, only variables that affect generation time were impactful to conservation status. Based on our data, primates with reproductive traits that shorten generation times appear to be more resilient to conservation challenges. Conservation efforts should be focused towards species with longer generation times as they are the most vulnerable to conservation threats.

HENRY HALL ATRIUM 011

Determining the Effect of U0126 Inhibiting ERK1/2 Protein in STZ-Induced Diabetic Mice

Participants attending 11:00 AM - 12:00 PM
Presenter: Caroline De Roo
Mentor: Ruijie Liu

Diabetes mellitus is a chronic metabolic disease with a hyperglycemic state. Without proper treatment, diabetic patients suffer damage to many organs, with cardiovascular complications being the main cause of death. Indeed, about 19~26% of diabetic patients develop cardiac dysfunction characterized by ventricular remodeling, myocardial stiffness, and eventual heart failure. Mitogen-activated protein kinases ERK1/2 have been shown to be involved in glucose and lipid metabolism, however their role in the development of diabetic cardiomyopathy is not clear. In this study, we used U0126 to pharmacologically inhibit ERK1/2 activity in streptozocin (STZ)-induced diabetic mice for 6 weeks to determine the effects on cardiac function. We found out that consecutive injection of U0126 at a dose of 15 mg/kg/day for 7 days significantly reduced the phosphorylation of ERK1/2 in mice. Mice demonstrated hyperglycemia 14 days post STZ injection and continued maintaining a high glucose level during the 6 weeks period. Compared to the control mice, diabetic mice had significant reduction of body and heart weights, although the cross-sectional areas were increased. In summary, we established a diabetic model by STZ injection to induce hyperglycemia in mice. We will compare the effects of U0126 on cardiac remodeling and expression of disease markers.

HENRY HALL ATRIUM 012

Assessing Littoral Dissolved Oxygen Trends in Muskegon Lake

Participants attending 11:00 AM - 12:00 PM
Presenter: John Lawrence
Mentor: Carl Ruetz

We assessed spatial and temporal dissolved oxygen trends within littoral habitats of Muskegon Lake. Littoral habitats are highly productive and support diverse ecological communities, and coincidentally are often the focal point of human interaction. We quantified the magnitude of diel oxygen fluxes during May, July, and September at four littoral sites in Muskegon during 2022-2023. Dissolved oxygen and temperature loggers collected time-series data for one day-night cycle. Additional readings of dissolved oxygen and temperature were taken with a sonde on the set and pull day of each logger. Percentage of SAV cover was visually estimated at each sampling site. Diel oxygen fluxes were the least extreme at sites with the lowest SAV cover. Dissolved oxygen never reached concentrations below 4 mg/L (i.e., threshold for mild hypoxia). However, oxygen supersaturation in excess of 20 mg/L was noticed during summer, which may be a proxy for eutrophication. This is likely due to external nutrient loading from the greater watershed, and the complex interactions between plant respiration and microbial decomposition of detritus. In Muskegon Lake SAV likely influences diel fluxes in dissolved oxygen and hypoxia was not present at littoral sites, though we suspect littoral hypoxia is more likely under different conditions.

HENRY HALL ATRIUM 013

Assessing the Role of Groundwater in Road Salt Pollution of Urban Lakes

Participants attending 9:00 AM - 10:00 AM, 3:00 PM - 4:00 PM
Presenter: Jacquelyn Molloseau
Mentor: Alan Steinman

Salinization of freshwater ecosystems via use of road de-icing salts has resulted in issues with the chemical and biological structures of these systems. In addition to surface water contamination, there are concerns about the effects of road salt pollution on groundwater and its role as a potential pathway to other freshwater systems. This study focused on an area in eastern Grand Rapids, MI where salt pollution is affecting a string of residential lakes. To assess the potential role of groundwater in the pollution of this system, we 1) assessed the presence of groundwater seepage using field data and ArcMap, and 2) collected groundwater and surface water samples from each lake with drive-point piezometers. Groundwater samples were tested for chloride, an element of road salt, and soluble reactive phosphorus to determine road salt and nutrient pollution. Although baseline levels of chloride before exposure to road salt are unknown, all samples were above the Michigan chronic limit. Phosphorus levels towards the end of the flowpath were elevated, indicating that there is a source of nutrient pollution within the system. Since surface and groundwater chloride levels were similar, further sampling is required to determine if groundwater is acting as a pollution pathway.

HENRY HALL ATRIUM 014

Strengthening Sociology Curriculum: An Undergraduate Course Addendum

Participants attending 9:00 AM - 10:00 AM
Presenter: Hana Testerman
Mentor: Jamie Langlois

An excellent undergraduate education is arguably the foundational strength of social workers entering the community. In introductory courses orienting students to the diverse career opportunities, information that is out of date or completely omitted is a particular disservice. With this in mind, this project completed a systematic update of an existing 200-level sociology course, including the creation of two new modules of information relevant to today's social work environment. Following the guidance of two Grand Challenges for Social Work, these new modules will highlight the intersection between environmental justice, racial discrimination, and socioeconomic class, as well as the impact on voter engagement on future social work practice.

HENRY HALL ATRIUM 015

The ABCs of the ADA

Participants attending 3:00 PM - 4:00 PM
Presenters: Kaylyn Guinn, Ashley Kolenbrander
Mentor: Jamie Langlois

The World Report on Disability suggests that there are over one billion individuals with disabilities, accounting for approximately 15% of the global population. In the United States, it is estimated that over 60 million people have disabilities, equating to about one in five citizens. The goal of our project, The ABC's of ADA, is to raise awareness about the ADA, disability accommodations, disability discrimination, and offer educational resources for social workers to enhance their practices when working with individuals with disabilities. Based on our research, there is a need for better comprehension of the ADA and how it fits into social work practice. This project supports agencies and social workers in delivering long-term, high-quality care to individuals with disabilities. Equality, opportunities, and inclusion are needed for everyone, this includes individuals with disabilities

HENRY HALL ATRIUM 016

Hot Topics Curriculum for the Boys and Girls Club

Participants attending 11:00 AM - 12:00 PM
Presenter: Bethany Czerny
Mentor: Jamie Langlois

Economically disadvantaged teens and youth are at a higher risk of experiencing challenges in life. They have big questions and require a safe space to talk to a trusted adult. I created a Hot Topics Curriculum for the Boys and Girls Club from research and collaboration. The program contains researched discussion topics that create a safe, non-judgmental space to allow teens to explore and discuss difficult questions. Student leaders emerged from the group who can now provide peer mentorship. The youth develop these topics and include mental health, safe sex, gun violence, and substance abuse. Teens need mentorship and guidance, the ability to talk to a trusted adult instead of googling their difficult questions.

HENRY HALL ATRIUM 017

Workforce Housing Project

Participants attending 4:00 PM - 5:00 PM
Presenter: Julian Silva
Mentor: Jamie Langlois

Ottawa County remains Michigan’s fastest-growing county among the state’s 10 most populous counties. With more people entering Ottawa county, affordable and available housing is scarce, and homelessness is more common for families. The Workforce Housing Proposal aims to raise money from organized events and grants to fund a Workforce Housing Unit to help alleviate these stressors. From our research and analysis, we are engaging stakeholders and people of the community to deligate funds for more affordable housing units to families in the community. Our project looks to advocate for those families who are in need of housing assistance by having set units in the following years. It is time for all to obtain affordable housing.

HENRY HALL ATRIUM 018

Working Under the Surface

Participants attending 12:00 PM - 1:00 PM
Presenter: El Beringer
Mentor: Jamie Langlois

Research indicates that 85% of employees experience inevitable conflicts at work. Half of coworker conflict occurs due to personality clashes and egos. Working Under the Surface aimed to construct a safe and productive space for coworkers to discuss this conflict, specifically harm around their identity. From our research and collaboration, we invited all members of a student affairs unit to participate and share their experiences. These conversations aspired to affirm coworkers' feelings, empower them to advocate, and participate in change efforts. What was learned in these spaces will eventually be implemented to accomplish a company culture shift in the student affairs unit. Ultimately, these changes are necessary to better serve the individuals who require their services.

HENRY HALL ATRIUM 019

Supporting the Sex Offender Panel

Participants attending 10:00 AM - 11:00 AM
Presenter: Nicole Sutton
Mentor: Jamie Langlois

The NASW Code of Ethics requires that practitioners respect the inherent dignity and worth of all individuals, yet many social workers struggle to empathize with sex offenders. This is concerning because most will work with a sex offender at some point in their career. Empathy training and preparation are needed. This project, Supporting the Sex Offender Panel, aims to increase empathy for sex offenders among social workers. Sex offender treatment practitioners discussed best practices, myths, and barriers to success when working with this population. It is necessary to respect the inherent dignity and worth of all those we serve - this includes sex offenders.

HENRY HALL ATRIUM 020

MyChart Use on a Psychiatric Medical Unit

Participants attending 9:00 AM - 10:00 AM
Presenter: Elyse Paxson
Mentor: Elizabeth Davis

Background: Patient portal use has increased over the years due to developing technology, especially within hospital systems. Patient portals allow patients to view their medications, read and watch educational materials, view their treatment team, and complete hospital questionnaires. This technology can assist in transparency of care and increased engagement, especially in behavioral health.

Purpose: The purpose of this quality improvement project was to increase patient engagement of MyChart on a inpatient psychiatric unit, aiming to lower length of stay and readmission rates while improving trust and communication with providers.

Methods: Utilizing a "train the trainer" approach, select staff among specialties of nursing, case management, social work, and activity therapy were educated on MyChart use and tasked to train the remainder of unit staff. After training was completed, patients were shown MyChart using at-the-elbow teaching by staff.

Results/Conclusions: Ongoing monitoring will occur over the following year. Auditing in areas of Net Promotor Scores, staff surveys, and overall patient engagement will be performed to assess project progression, pre- and post-implementation.

HENRY HALL ATRIUM 021

How Does Aquatics Therapy Impact Parkinson's Disease?

Participants attending 9:00 AM - 10:00 AM
Presenter: Hope Winslow
Mentor: Dawn De Vries

This poster will show findings of the positive impact of aquatics therapy on the symptoms of Parkinson's Disease. Aquatics therapy has been shown to improve balance, decrease fall risk and increase mobility for individuals diagnosed with Parkinson's Disease.

HENRY HALL ATRIUM 022

How Does Horticulture Affect Individuals with Attention Disorders?

Participants attending 11:00 AM - 12:00 PM
Presenter: Adeline VanNoller
Mentor: Dawn De Vries

This presentation will look at the effects of horticulture on individuals with attention disorders such as ADD, ADHD, dementia, etc. Horticulture has been proven to have many benefits such as improved attention span, concentration, task initiation, and socialization.

HENRY HALL ATRIUM 023

Roots of Recovery: Exploring the Effects of Nature-Based Therapy in Cancer Rehabilitation

Participants attending 9:00 AM - 10:00 AM
Presenter: Samantha Mason
Mentor: Dawn De Vries

This presentation will explore the therapeutic effects of various nature-based therapy modalities on individuals with a history of cancer. Through an extensive literature review, we find that the benefits of nature-based therapy ultimately demonstrate a positive contribution to increased quality of life and wellbeing in oncology treatment.

HENRY HALL ATRIUM 024

Paws with Purpose: Animal Assisted Interventions for hildren with Autism

Participants attending 9:00 AM - 10:00 AM

Presenter: Olivia Driscoll
Mentor: Dawn De Vries

This poster will present on the affects that animal-assisted interventions have on children with Autism.

HENRY HALL ATRIUM 025

How can Games Impact the Quality of Life of Individuals with Traumatic Brain Injury?

Participants attending 11:00 AM - 12:00 PM
Presenter: Lauryn Steel
Mentor: Dawn De Vries

This presentation will overview how a variety of games enhance and impact the overall quality of life of an individual with traumatic brain disorder (TBI). Many different forms of games (board games, computer games, etc.) have been shown to improve cognitive, social, emotional, and even physical health.

HENRY HALL ATRIUM 026

Narrowing the 'Legacy Gap': A Systematic Review

Participants attending 2:00 PM - 3:00 PM
Presenter: Nicholas Saarela
Mentors: Jamie Langlois, Emily Nichols

Attachment theory studies the formation of primary attachment figures in childhood. Research shows the behavior of the primary attachment figure towards the child indicates how the child treats their partners in adulthood. Further, longstanding research shows conclusively that Adverse Childhood Experiences (ACEs) strongly correlate to negative late-life health outcomes, including affective disorders. Research on when these negative health outcomes from ACEs first start to emerge, however, remains largely unaddressed. "The Legacy Gap" refers to the time between when ACEs occur, and when ACE-related negative health outcomes become recognizable. The purpose of this systematic review is to examine research on both ACEs and attachment. This examination will point out the unfilled need for research on ACEs and attachment styles forming at the same time in a child's life, making it likely that experiences leading to ACEs also lead to negative attachment. Because both form at the same time, and because in adulthood attachment styles are identifiable much earlier in life than ACE outcomes, the emergence of negative attachment styles can function as a diagnostic tool for therapists in evaluating for affective disorders. This can narrow the legacy gap significantly, and make treatment more manageable through earlier diagnosis.

HENRY HALL ATRIUM 027

Horticulture Benefits for Traumatic Brain Injuries

Participants attending 9:00 AM - 10:00 AM
Presenter: Ella Acton
Mentor: Dawn De Vries

This poster will present the findings of a literature review on the benefits horticulature have for traumatic brain injuries.

HENRY HALL ATRIUM 028

Using Tai Chi to Improve the Lives of Refugees

Participants attending 9:00 AM - 10:00 AM
Presenter: Isabel Gordon
Mentor: Dawn De Vries

This poster will present findings of a literture review of the benfits that Tai Chi can have on Refugee populations.

HENRY HALL ATRIUM 029

More for Momma: Complementary Care for Postpartum Depression

Participants attending 9:00 AM - 10:00 AM
Presenter: Olivia Adgate
Mentor: Dawn De Vries

This presentation will present findings of a literature review on complementary care for postpartum depression (PPD). The research aims to define the specific benefits of aromatherapy and acupressure/acupuncture towards PPD symptomology. The overall goal is to promote complementary care as a technique for improved health care services towards an overlooked population.

HENRY HALL ATRIUM 030

Exploring the Effects of Canine Companionship on Mental Health

Participants attending 9:00 AM - 10:00 AM
Presenter: Myriam Martinez
Mentor: Dawn De Vries

This poster will present findings of peer reviewed articles on the therapeutic benefits of canine assiststed therapy. More specifically, it will explore the effects of canine assisted therapy on mental health in adults.

HENRY HALL ATRIUM 031

Caregiver-Mediated Intervention for Children with Autism Spectrum Disorders

Participants attending 9:00 AM - 10:00 AM
Presenter: Sydney Higgins
Mentor: Dawn De Vries

The effectiveness of caregiver-mediated interventions for children with autism spectrum disorders will be discussed throughout this presentation.

HENRY HALL ATRIUM 032

Pawsitive Therapy: Easing Autism Stress with Animal-Assisted Interventions

Participants attending 9:00 AM - 10:00 AM
Presenter: Kassidi Hill
Mentor: Dawn De Vries

This literature review examines the impact of animal-assisted therapy (AAT) on stress and anxiety levels in individuals with autism spectrum disorder (ASD). ASD is characterized by difficulties in social interaction, communication, and repetitive behaviors, often accompanied by heightened levels of stress and anxiety. Animal-assisted therapy, involving interactions with trained animals such as dogs or horses, has gained attention as a potential complementary intervention for individuals with ASD. Through a comprehensive review of existing research studies, this review explores the effectiveness of AAT in reducing stress and anxiety in individuals with ASD across different age groups and settings.

HENRY HALL ATRIUM 033

Back to Life; Dementia and the Power of Music

Participants attending 9:00 AM - 10:00 AM
Presenter: Nicole Bolter
Mentor: Dawn De Vries

This poster presentation will show how beneficial the therapeutic use of music can be for those with dementia.

HENRY HALL ATRIUM 034

Sibling or Sidedish: Cannibalism vs. Kinship Recognition in Baby Spiders

Participants attending 2:00 PM - 3:00 PM
Presenters: Eden Hodgson, Cassandra Hundley, Luc McPherson, Andrew Medley
Mentor: Michael Henshaw

Kin recognition and relatedness play a crucial role in shaping social interactions amongst organisms. Furthermore, kinship theory suggests that genetically similar relatives should benefit from aiding one another. In the jumping spider Phidippus audax, the spiderlings are reared together in the egg sac with some care from the mother. After leaving the egg sac, however, jumping spiders are primarily solitary animals where cannibalism is frequent. In this study, we investigated the potential influence of relatedness on mortality rates in Phidippus audax. We set up 90 trials consisting of 30 solitary spiders (control), 30 pairs of related spiders, and 30 pairs of unrelated spiders. We hypothesized that spiderlings would cannibalize related partners less often than unrelated partners, resulting in lower mortality rates among related juveniles than in unrelated juveniles. This research will further our understanding of social interactions within solitary and subsocial species.

HENRY HALL ATRIUM 035

Synthesis of a Tripodal-CMPO Ligand for f-element Extractions

Participants attending 1:00 PM - 2:00 PM
Presenter: Katherine Mast
Mentor: Shannon Biros

The demand for f-elements is increasing due to their many common uses in rechargeable batteries, magnets, lamp phosphors, catalysts, and more, yet efficient recycling methods are still lacking. Current felement separation processes incorporate the use of an organic compound that extracts the metal ion(s) out of acidic aqueous solution and into an organic solvent. To help recover these f-elements from endof-life materials, we have synthesized[SB1] a tripodal-CMPO ligand bearing six hydrophobic, branched alkyl chains. The extraction capabilities of this ligand along with various solution studies will be discussed.

HENRY HALL ATRIUM 036

Investigating the Role of Spatial Structure on the Origination of Adaptive Processes

Participants attending 1:00 PM - 2:00 PM, 2:00 PM - 3:00 PM
Presenter: John Shea
Mentor: Alexander Lalejini

Understanding the origin of life requires understanding how chemical reaction networks come together to form systems capable of adaptive complexification. Darwinian evolution drives the adaptive complexification of biological organisms, but how do these evolutionary processes begin? Evolutionary theory presupposes the existence of a population of genetic replicators, and simple genetic life cycles are likely too complex to spontaneously originate from random chemical reactions. One hypothesis is that pre-genetic adaptive processes emerged in chemical reaction networks made up of interacting autocatalytic cycles (i.e., self-amplifying networks of chemical reactions). For example, autocatalytic systems better exploit available resources or that contain more synergistic interactions may more efficiently diffuse across an environment. Biases toward more efficient reaction networks could then drive a gradual transition to populations of genetic replicators, which are themselves chemical reaction networks. Testing the feasibility of pre-genetic adaptive dynamics is challenging in the laboratory, motivating computational modeling for rapid hypothesis testing prior to conducting laboratory studies. We will use a computational model of chemical reaction networks to study how different patterns of environmental connectivity influences the possibility of adaptive dynamics.

HENRY HALL ATRIUM 037

Exploiting Phylogenetic Analysis to Improve Evolutionary Search Algorithms

Participants attending 10:00 AM - 11:00 AM, 12:00 PM - 1:00 PM, 4:00 PM - 5:00 PM
Presenter: Marcos Sanson
Mentor: Alexander Lalejini

Evolutionary algorithms harness the principles of natural evolution as a general purpose search engine for solving challenging computational and engineering problems. Evolutionary search algorithms begin with an initial population of candidate solutions. Each generation, individuals are evaluated on one or more fitness" criteria, and then promising individuals are selected to be used to construct the next generation of candidate solutions. Finite computing resources limit the scale at which evolutionary algorithms can be applied, especially for multiobjective problems with many evaluation criteria. One strategy for scaling up evolutionary algorithms to tackle these problems is to assess each candidate solution on a small subsample of evaluation criteria, trading evaluation thoroughness for computational savings. Current subsampling methods, however, have been shown to sometimes omit important evaluation criteria, limiting their problem-solving success. Here, we develop novel subsampling methods for evolutionary algorithms by exploiting runtime phylogenetic analyses. We analyze the accuracy of phylogeny-based fitness estimates and then empirically test the impact of inaccurate estimates, identifying how accurate estimates must be to not impede search performance.

HENRY HALL ATRIUM 038

The Kids Aren't Alright

Participants attending 12:00 PM - 1:00 PM
Presenters: Timothy Giovas, Shanna McElrath, Alexia Sisty
Mentor: Michael Henshaw

While pesticides are an incredibly valuable tool to control agricultural pests, they also have harmful effects, including unintentional effects on beneficial insects and arthropods. Pesticides have caused a reduction in natural predator species, creating a feedback loop of increased dependence on pesticides which, in turn, further fuels this cycle. P. audax is a common and widely-distributed North American spider that preys upon potential pest insects. Overspray and other incidental dispersals of common pesticides have been shown to affect the behavior of adult P. audax (Royaute et al. 2015). While previous studies have demonstrated sub-lethal effects of pesticides on adult P. audax behavior, few data have been collected on the non-lethal developmental effects of pesticides on juveniles. P. audax are active hunters meaning they do not rely on webs but will seek out and hunt their prey. Therefore, learned behavior during development is crucial for their use of stealth, prey identification, and accurate pounces. In this study, we investigated the effect of non-lethal exposure to Malathion on the hunting success of developing P. audax spiders. By examining their hunting success over one month we also assessed differences in their ability to learn to hunt more effectively.

HENRY HALL ATRIUM 039

Synthesis of Tripodal, Multidentate CMPO Compounds with Long Alkyl Chains for f-element Extractions

Participants attending 9:00 AM - 10:00 AM
Presenter: Brianna Gordon
Mentor: Shannon Biros

As researchers work to develop alternative sources of energy, nuclear power remains a viable option. Unfortunately, spent nuclear fuel is contaminated with many radioactive metals that are harmful to the environment and difficult to process. Organic ligands are commonly used as extractants to remediate nuclear waste and make nuclear power a more sustainable energy source. The synthesis of new organic ligands that can carry out these extraction processes more efficiently is an active area of research and will add to the current understanding of f-element coordination chemistry. We have prepared a series of tripodal carbamoylmethylphosphine oxide (CMPO) ligands as new extraction agents for f-elements. The ligands' extraction ability toward all lanthanide ions (except Pm), Th , and UO will be presented. Luminescence lifetimes were also measured to investigate the influence of CMPO substituents on the solution structure of the metal complexes.

HENRY HALL ATRIUM 040

All Roads Lead to Home: Exploring the Complexities of Home in Antiquity

Participants attending 9:00 AM - 10:00 AM, 10:00 AM - 11:00 AM, 12:00 PM - 1:00 PM, 1:00 PM - 2:00 PM
Presenters: Caroline Collier, Westley Garnet, Martin Hall, Elinor Harrison, Kate Kripli, Jacob Morgan, Kelly
Morgan, Grayce Richards, Sydney Sturgis
Mentor: Melissa Morison

Across the world, no matter who you are or whence you hail, you understand the importance and complexity of home. Home is a concept with many facets, all contributing in different ways to its meaning. For some, it can be a physical space, contained within four walls and a roof; for others it could be the physical manifestation of something more abstract, such as a family unit. Were ancient Greek and Roman ideas similar to, or different from, contemporary visions of home? We each investigated a different aspect of the broad, fluid (and ever metamorphosing) ancient Greco-Roman conceptions of home using a variety of sources, both textual and material. Through the lenses of diet, gender, humor, emotion, power, space, religion, and myth, we sought to understand the multifaceted complexity of home in the ancient Mediterranean and to extend that understanding to imagining potential solutions to contemporary problems.

HENRY HALL ATRIUM 041

Lanthanide Extractions via Organic Compound

Participants attending 9:00 AM - 10:00 AM
Presenter: Colin Carter
Mentor: Shannon Biros

As technology continues to become more prevalent in modern society, the resources that are used to make them also become more important. One such resource, rare-earth metals (REE) involve many elements from the f-block of the periodic table, that are difficult to obtain from mining procedures and even harder to separate from each other. One solution has been to use organic ligands to extract the target metal for reuse of the REE in future technology. The synthesis of new ligands that have a better efficiency of extracting the target metal has been an important research topic recently. This poster will describe the structure of a new ligand and its ability to bind and extract REE's.

HENRY HALL ATRIUM 042

A Multi-Mediation Model for Living One's Calling on Job Stress

Participants attending 3:00 PM - 4:00 PM
Presenter: Leah Fetzer
Mentor: Benjamin Walsh

Work as Calling Theory (WCT) poses that living one's calling (LC) is an ultimate destiny, going beyond one's ego, to engage in a specific work role with a deep sense of purpose. By living one's calling, primary sources of motivation come from other cherished values and goals. Previous literature suggests that LC enhances one's job satisfaction as well as one's sense of thriving at work and decreases job stress. We propose that when individuals are living their calling, it results in higher levels of job satisfaction (H1) and increased thriving within their work environment (H2). Furthermore, we hypothesize that heightened job satisfaction (H3) and thriving at work (H4) lead to decreased levels of job-related stress. Lastly, we predict that the increased job satisfaction (H5a) and thriving at work (H5b) serve as mediators in the negative relationship between LC and experiencing job stress. We tested our hypotheses with survey responses from 329 participants, using validated measures of each construct. Results from OLS regression analyses supported all hypotheses. Collectively, our research further validates the positive outcomes of living one's calling within the workplace.

HENRY HALL ATRIUM 043

The Effects of Ethical Leadership and Diversity Climate on Burnout

Participants attending 10:00 AM - 11:00 AM
Presenter: Kileen Orr
Mentor: Benjamin Walsh

Burnout is a psychological response to work stress, often perpetuated by multiple factors. Two particular factors, ethical leadership and diversity climate, may significantly influence burnout's occurrence or prevention in workplaces. Both elements emphasize trust promotion in leadership and the organization by employees. This study hypothesizes that ethical leadership is associated with a positive diversity climate, which mediates the negative impact of ethical leadership on burnout. Anonymized survey data from childcare-center workers were used to test these hypotheses, employing validated scales to measure burnout rates, ethical leadership, and diversity climate. Results from regression analysis showed that ethical leadership was positively related to burnout. Moreover, as diversity climate increases, burnout decreases, controlling for the effect of ethical leadership. The study's findings have significant implications for research on burnout, ethical leadership, and diversity climate. Based on these results, organizations should develop ethical leadership and build diversity climate to mitigate burnout.

HENRY HALL ATRIUM 044

Kinetic Characterization of the Class D β-lactamase OXA-146 with a Series of BATSIs

Participants attending 2:00 PM - 3:00 PM
Presenter: Paige Moser
Mentor: Rachel Powers

β-Lactams, the most prescribed class of antibiotics, are characterized by a four-membered cyclic amide known as the lactam ring. Due to misuse of these drugs, antibiotic resistance has emerged as a global health threat, and their efficacy is at risk. A major component of resistance is production of β-lactamase enzymes that cleave the lactam ring, rendering the antibiotic useless. As effective treatment options are dwindling, there is a vital need for inhibitors to counteract the disarming nature of β-lactamases. Boronic Acid Transition State Inhibitors (BATSIs) have high efficiency in inhibiting class A and C β-lactamases; however, there are no known effective inhibitors for class D enzymes, known as OXAs. OXA-146 is a variant of OXA-23 that contains an alanine duplication at position 220 within the β5/β6 loop, and changes in this region are implicated in conferring expanded-spectrum activity to the enzyme. In an effort to identify inhibitors of OXA-146, several BATSIs were ordered and tested against the enzyme in competition kinetics experiments. Interestingly, those compounds containing a benzoxaborole were found to be the best inhibitors of OXA-146, with Ki values between 20-40 μM. The benzoxaborole may offer a novel scaffold to optimize in future class D β-lactamase inhibitor design efforts.

HENRY HALL ATRIUM 045

Deforestation at Brownsberg Nature Park, Suriname, over Two Decades

Participants attending 9:00 AM - 10:00 AM
Presenter: Daniela De Andrade
Mentor: Cynthia Thompson

Tropical areas of South America are currently threatened by illegal gold mining. This issue leads to widescale deforestation and mercury contamination, which can have harmful outcomes for wildlife. Brownsberg Nature Park, Suriname, houses extraordinary biodiversity and although nominally protected, is heavily threatened by mining. Our goal was to calculate forest loss in the park over the past two decades. We analyzed satellite images of a 9.5 km² area within Brownsberg Nature Park from 2003, 2010, and 2020. The satellite images were superimposed with a 100m x 100m grid. Grid cells were then scored for the amount of forest cover to estimate total deforestation at the park. There was 8.54% deforestation over the 17-year period, with 6.10% of forest loss between 2003 and 2013 and 2.44% loss between 2013 and 2020. The yearly mean forest loss rate was 0.61% between 2003-2013 and 0.12% between 2013- 2020. Deforestation at Brownsberg was significant, especially over the earlier period, but the rate of loss slowed after 2013. The impacts of this habitat degradation on the unique flora and fauna of Brownsberg Nature Park have not yet been measured.

HENRY HALL ATRIUM 046

A Systematic Review and Concept Mapping to Explore Knowledge and Gaps Surrounding the Professional Identity in Nursing

Participants attending 11:00 AM - 12:00 PM
Presenter: Sarah Geoghan
Mentor: Susan Strouse

Introduction: Established in 2020, the International Society for Professional Identity in Nursing (ISPIN) developed a definition of professional identity in nursing (PIN). This definition encompasses four domains: values and ethics, knowledge, nurse as leader, and professional comportment. Objectives: A systematic review and concept mapping was completed identifying knowledge strengths and gaps for this definition. Methods: Sources involved peer-reviewed studies published from January 2018 to December 2023 from CINAHL, Google Scholar, PubMed, and gray literature through ISPIN archived publications by two researchers using a PRISMA flow diagram. Twenty-seven studies met inclusion criteria and were extracted from 4,020 initially identified articles. Discussion: One article discussed one domain, while the remaining articles discussed at least two of the four PIN domains. Knowledge domain was discussed in 16 of 27 articles; professional comportment was discussed in 18 articles. Value and ethics were discussed in 16 articles; nurse as leader was discussed in 17 articles. Conclusion: Few PIN studies used quantitative methodology. Twenty of the retrieved articles were considered expert accounts, conceptual discussion or opinions, common for a relatively new concept. This suggests the need for further research literature especially in all domains of PIN.

HENRY HALL ATRIUM 047

The Effect of Mindful Sport Performance Enhancement on F.A.M.E. (Flow, anxiety, mindfulness, emotion regulation)

Participants attending 10:00 AM - 11:00 AM
Presenter: Jillian Liford
Mentor: Christina Beaudoin

When one thinks of sports one often thinks about the physical demands that it requires from athletes. But one also hears the saying, “sports is 10% physical 90% mental”. So why do athletes not train their minds? Most didn’t before the uprising of mental training programs like Psychological Skills Training (PST) or Mindfulness-Based Stress Reduction which helped athletes strengthen the mental side of their game. In more recent years the mental training program Mindful Sport Performance Enhancement has gained popularity because of its outstanding results. Its goal is to improve flow, a key aspect of performance, also known as the scientific term for being “in the zone”. The original MSPE study was conducted by Kaufman et al. (2009) which included six sessions of mindfulness training and practice with group discussion as an important role. The following study is a replication of the Kaufman et al. study including five female club softball players who will complete six one-hour sessions that involve mindfulness exercises and group discussion to achieve a greater state of flow and thus optimal performance.

HENRY HALL ATRIUM 048

Isoforms of GAP-43: Making Connections to Alzheimer’s Disease

Participants attending 12:00 PM - 1:00 PM, 1:00 PM - 2:00 PM, 2:00 PM - 3:00 PM
Presenters: Kates Krasin, Caitlin Lutz, Jacob Reed, Jamie Valkenburg, Connor Veen
Mentors: John Capodilupo, Jerry Keeney

Alzheimer’s disease (AD) is a neurodegenerative disorder characterized by cognitive and behavioral impairment. Efforts to identify biomarkers of AD pathogenesis largely focus on examining levels of betaamyloid (A-beta) plaques and neurofibrillary tangles. As a result, additional primary pathogenic factors of AD potentially contributing to neuronal death and synaptic dysfunction have been less appreciated. Our focus is to examine the phosphorylated and non-phosphorylated isoforms of GAP-43, a growth associated protein widely expressed in neurons. Previous reports demonstrate the phosphorylated isoform increases during learning and memory formation. We believe the relative ratio of these two isoforms may serve as a novel biomarker for AD and, potentially, a new target for drug therapy. This poster presents the results of the first step of our research, which is to enhance resolution of GAP-43 isoforms using 2D-SDS-PAGE.

HENRY HALL ATRIUM 049

Sedimentology and Petrography of 2.2 Ga Randville Dolomite Stromatolites, Upper Peninsula of Michigan

Participants attending 2:00 PM - 3:00 PM
Presenter: Garrett Brown
Mentor: Dylan Wilmeth

The Lomagundi-Jatuli Event (LJE) ~2.2 billion years old (Ga) was a massive change in the global carbon cycle. Most LJE deposits have extremely enriched carbon isotopes (+5-10 ‰) compared to any others in Earth's history. The LJE’s exact causes remain uncertain, with various hypotheses involving shifts in global oxidation or changes in local environments. The 2.2 Ga Randville Dolomite was deposited during the LJE, but contains less enriched carbon isotopes (0-3‰) compared to neighboring deposits such as the Kona Dolomite. One possible explanation for local variations in LJE isotopes is different depositional environments. Heavier isotopes are often concentrated in restricted, evaporitic basins such as the Kona Dolomite, while less-restricted shorelines typically record carbon isotopes in global seawater. Samples of Randville Dolomite were collected from Iron Mountain, Michigan. Despite a slightly higher metamorphic grade, Randville Dolomite preservation is comparable to the Kona Dolomite, and any differences in chemistry are likely primary. Structures, including cross-beds, conglomerates, stromatolites, and evaporative minerals, were used to understand their depositional environment. Findings indicate the Kona Dolomite was deposited in a shallow restricted environment, whereas the Randville Dolomite was less restricted. Our results indicate environmental variation may be a key determinant in isotope concentrations.

HENRY HALL ATRIUM 050

The Effects of Gut Volume and Parity on the Pubis

Participants attending 10:00 AM - 11:00 AM
Presenters: Emma Long, Emma Piasecki
Mentor: Natalie Laudicina

This project examines the relationship between two pelvic structures and how those structures are affected by gut volume and parity. The pubic symphysis (PS) is a unique joint that forms the anterior connection between the two hip bones, absorbs forces while walking, and allows for pelvic expansion during labor. The pubic arch is an angle at the inferior portion of the anterior pelvis, below the pubic symphysis, formed by the articulation of the hip bones.

This project used 3D software to measure the pubic symphysis width (PSW) and pubic arch width (PAW) on 100 human CT scans. We created a standardized method to measure the PSW and PAW by analyzing three points (superior, middle, and inferior). These measurements were compared to gut volume values and parity (number of live births). We hypothesized that as gut size increases, so does PSW and PAW to

accommodate this increased mass. Our second component, parity, sought to understand how the number of live births can change the bone structure of the pelvis. This data allowed us to hypothesize how parity and gut volume may contribute to pelvic girdle pain to better treat individuals.

HENRY HALL ATRIUM 051

How Similar are Two Candida albicans Phosphatase Enzymes in their Regulation of Virulence Traits?

Participants attending 9:00 AM - 10:00 AM
Presenter: Kaitlyn Knapp
Mentors: Ian Cleary, Derek Thomas

One of the most common hospital-acquired infections in the United States is the fungus and opportunistic pathogen, Candida albicans. C. albicans is part of the human microbial population and can grow in yeast or filamentous forms depending on specific growth conditions. To better understand the regulatory relationship between the different filamentous forms, this research investigates the impacts of over-expressing two specific genes. The first gene, PHO13, has been found to inhibit filamentation in the wild-type strain and exhibited limited effects on constitutively filamentous strains. The second gene, 19.1405, encodes a similar phosphatase. This gene was overexpressed in the wild-type strain and initial results indicate that there is not an effect on filamentation. This suggests that the two similar genes may have different functions.

HENRY HALL ATRIUM 052

Traumatic Brain Injury: Approaches to Treatment

Participants attending 9:00 AM - 10:00 AM
Presenter: Lindsey Bunday
Mentor: John Capodilupo

Traumatic brain injury (TBI), where a violent outside force causes damage and dysfunction to the brain, presents a significant national burden to the United States. The anatomy and physiology of the brain efficiently work together to control the body's functions, so disruption of its structures result in focal, diffuse, and secondary brain injuries that can have both acute and chronic consequences. Once clinical evaluation and diagnosis are completed and TBI is established, acute management, surgical procedures, pharmaceutical interventions, and therapeutic management are implemented. However, gaps and challenges in these current treatment options establish a need for new methods and therapeutics, those of which are under current research. The goal of this capstone project seeks to provide a comprehensive review of TBI, focusing on potential advances in treatment including interventions such as cell-based therapy, serum biomarkers, and other therapeutics; these have the potential to revolutionize treatment for TBI.

HENRY HALL ATRIUM 053

Computational Docking Approach to Antibiotic Design

Participants attending 10:00 AM - 11:00 AM
Presenter: Nicolette Owen

Mentor: Matthew Hart

Tuberculosis is an infectious respiratory bacterial illness which can be treated with antibiotic drugs. Designing novel antibiotics is always a priority for researchers, but determining what aspects of a molecule make an effective drug is less straightforward. Computational chemistry and AutoDock software were used to determine potential candidates for organic antibiotic synthesis. Various diphenyl ureas and amides were manipulated and tested against a known tuberculosis protein target, with the strongest binding affinity of -9 kJ/mol coming from a combination of an amide with a biphenyl group and N,N,3- trimethyl benzeneethanamine. These computational results are currently guiding our synthetic research.

HENRY HALL ATRIUM 054

Evaluating the Effects of Cholesterol on HER2+ Breast Cancer Cells

Participants attending 10:00 AM - 11:00 AM
Presenter: Madelyn Maurer
Mentor: Osman Patel

In the US ~350,000 new cases of BC will be diagnosed in 2024, with nearly 45,000 being fatal, making BC a leader of female cancer mortality. The US also has a high prevalence rate for obesity affecting ~42% of the adult population. Hypercholesterolemia is a dominant factor in the pathophysiology of obesity and is directly linked to the malignancy of endometrial cancer. The role of hypercholesterolemia in the development and progression of hormone-receptor positive (HR+) BC remains to be elucidated. In this study, the effect of cholesterol supplementation (0 μM - 7.5 μM) on HR+ BC cells (MCF-7) was evaluated. Our preliminary findings show that increasing cholesterol concentration to 7.5 μM decreased the number of live BC cells by ~50% and almost doubled the number of apoptotic cells compared to the control. A recent study showed that HER2 facilitates the intracellular migration of cholesterol. Hence, in this study, we are evaluating the effect of cholesterol on HER2+ BC cells. Our supposition is that there will be an elevated uptake of cholesterol by BC cells due to the overexpression of HER2.

HENRY HALL ATRIUM 055

Social Justice Begins With Me: Environmental Justice

Participants attending 2:00 PM - 3:00 PM
Presenter: Danielle Ellis
Mentor: Jamie Langlois

Over 75 percent of the Earth's land surface has been significantly altered by human behavior, including 85 percent of wetland areas. Climate change will have long-lasting implications, including deteriorating conditions for all life. The implications include patterns of extreme weather to the destruction of delicate ecosystems. Social Justice Begins With ME! aims to introduce children to the challenges of climate change. From the research and collaboration, I examined and identified literature that cultivates exploration on climate change. Reading books to children on climate change promotes opportunities for them to reflect and take action. Climate change is advancing faster than species can adapt. It is time to create space for caregivers and children to explore the implications of climate change.

HENRY HALL ATRIUM 056

Discourses on Belonging and the University Student

Participants attending 9:00 AM - 10:00 AM
Presenter: Louis Cousino
Mentor: Rachel Campbell

Students' sense of belonging at the university is important for a myriad of reasons, including retention and completion of a degree (Demetriou et al. 2017). Additionally, many resources are dedicated to helping students feel like they belong; the National Center for Education Statistics estimates that public, 4-year institutions spend 28% of their resources on academic support, student services, and institutional support. (2021). This research seeks to understand how the students themselves think about belonging. Four focus groups were conducted to understand how students discuss the phenomenon among their peers. The themes explored include interaction with classmates, the importance of community, and student recommendations for their university. Moving forward, this project strives to create a more welcoming environment in higher education for all students.

HENRY HALL ATRIUM 057

Adjunct Professor Satisfaction at GVSU

Participants attending 9:00 AM - 10:00 AM
Presenter: Sydney Lynn
Mentor: Mary Bair

Adjunct instructors constitute a significant portion of the higher education teaching workforce in the United States, yet there remains a gap in understanding their work and concerns as educators. This study aims to address this gap by investigating the characteristics and experiences of adjunct faculty at two colleges within Grand Valley State University (GVSU). Guided by a literature review, a survey was developed to explore adjunct faculty qualifications, motivations for teaching at GVSU, job satisfaction, perceptions of institutional supports, and their identified needs. The survey was administered to adjunct faculty at College A during the fall semester and at College B during the winter semester. Data collection and analysis are underway, with the goal of identifying opportunities to enhance support for adjunct faculty at GVSU.

HENRY HALL ATRIUM 058

Archives in Michigan: Guidance for First Time Researchers

Participants attending 11:00 AM - 12:00 PM
Presenter: Hannah Krebs
Mentor: Leigh Rupinski

Archival research can be intimidating and unfamiliar to undergraduate and first-time researchers, yet many institutions assume of their patrons some level of experience with archives. In order to make archival research more accessible, I created a website to fill in these gaps of knowledge for beginner researchers in Michigan. Through discussions with library and archival professionals, I have compiled data on research procedures and advice for first time researchers at over 60 archival institutions in Michigan. My research has increased awareness among archival professionals of accessibility within their own institutions. With a twofold effect, this project aims to improve user experience and preparedness among researchers and inspire library and archival professionals to consider hidden accessibility concerns, especially from first time researchers.

HENRY HALL ATRIUM 059

Assessment of Molybdenum in Galleria mellonella

Participants attending 9:00 AM - 10:00 AM
Presenters: Indie Sobiech, Jonathan Tran
Mentors: Babasola Fateye, Maria Kwesiga

Molybdenum is an essential element for living organisms and it participates in many enzymatic reactions. Galleria mellonella (wax-moth larva model) has many advantages such as it has the capacity to grow at a temperature of 37°C like mammals and has a vast deal of anatomical and functional similarities between the innate immune systems of mammals and insects. The aim of this study is to assess molybdenum toxicity in the Galleria mellonella model. Molybdenum was given via intrahaemocoelic injection or gavage (force-feeding) to track survival, melanization and activity. Histological procedures were also done by using common laboratory techniques of dissection, fixation, processing, and staining to look at the effects of molybdenum on the Malpighian tubule and the gut. At low dosage of molybdenum, it was found to have a higher survival rate, low melanization, higher activity rate and less effects on the malphagian tubules and gut. The current study suggested that small amounts of molybdenum enhance the survival of G. mellonella, but large amounts led to mortality and damage to its organs.

HENRY HALL ATRIUM 060

Co-CRISPR/cas9 Disruption of the Arylalkylamine N-acetyltransferase-like 7 (AANATL-7) Gene in Drosophila melanogaster

Participants attending 9:00 AM - 10:00 AM, 10:00 AM - 11:00 AM, 11:00 AM - 12:00 PM, 12:00 PM - 1:00 PM, 4:00 PM - 5:00 PM
Presenters: Lydia Cruce, Margaret Cubitt
Mentor: Martin Burg

Chemical evidence indicates that N-acetylhistamine (NAH), an acetylated form of histamine, is present in the accessory gland of D. melanogaster males. NAH synthesis likely depends on the activity of the arylalkylamine N-acetyltransferase-type 7 (AANATL-7) enzyme, which has been shown to acetylate histamine in vitro. The AANATL-7 gene is expressed in accessory glands, leading to the hypothesis that disrupting the AANATL-7 gene will eliminate NAH synthesis in these glands. We took a co-CRISPR/cas9 mutagenic approach to disrupt the function of the AANATL-7 gene. gRNA-containing plasmids were developed that targeted both the AANATL-7 and ebony genes and were co-injected into neo-cas9 embryos. The resultant G0 flies were mated with ebony mutant flies to determine whether disruption of ebony occurred, as CRISPR-induced ebony mutants would indicate that the AANATL-7 gene is disrupted as well, shortening genetic screening. Once "mutant" ebony isogenic lines were established, they were examined for disruptions in the AANATL-7 gene through genomic PCR screening and DNA sequencing. Three types of mutants were generated: 1, 2, and 20 base pair deletions, all of which disrupted the function of AANATL-7, blocking NAH synthesis in the accessory gland. These mutant flies can now be

used for future studies of NAH function in vivo.

HENRY HALL ATRIUM 061

Emotion Socializaiton in Cultural Perspective: Investigating a Western biased Instrument

Participants attending 9:00 AM - 10:00 AM, 12:00 PM - 1:00 PM, 1:00 PM - 2:00 PM
Presenters: Victoria Airo, Ian Wilson
Mentor: Wolfgang Friedlmeier

Parental expectations regarding appropriate emotion regulation differ across cultures. To assess emotion regulation strategies of parents towards young children, most studies applied the CCNES (Coping with Children's Negative Emotions), a vignette-based quantitative measure created in the US (Fabes et al., 2002). Six behavior reactions represent two main strategies: supportive (problem-focused, emotionfocused response, expressive encouragement) versus non-supportive strategies (minimization, punitive reaction, and distress). As emotion norms vary culturally, researchers in non-Western countries (e.g., India, Hong Kong, China) created ad-hoc culture-relevant adjustments when applying the CCNES. The goal of this poster is to present these culture-based modifications. Such adjustments can refer to (a) the structure of main strategies (e.g., Yeo et al., 2020); (b) additional strategies (e.g., Gamble et al., 2007; Raval & Martini, 2011); (c) emotions (Raval & Martini, 2011); (d) vignettes content is changed (e.g., Tao et al., 2010), and (e) context issues (Raval et al., 2014). We will also present some mean comparisons for the strategies for different cultural samples for comparison. This literature review will represent the basis information for the future project to create an integrative and more culture-sensitive instrument that assesses emotion socialization strategies of parents in a cultural perspective in a more comprehensive way.

Find instructions on how to access Live Virtual and recorded presentations on our website.

HENRY HALL ATRIUM 062

Validity of Derived Life Space Measurements of Older Adults from Real Time Tracking Compared to Self Report Life Space Variables

Participants attending 9:00 AM - 10:00 AM
Presenter: Carly Rinas
Mentor: Rebecca Davis

Life space measures are a numerical representation of the spatial distance in which a person travels, ranging from small life space (confined to one's room) to a large life space (travels extensively outside of living community). When living in assisted living facilities, older adults, especially those with cognitive impairment, may struggle with wayfinding and get lost easily; this may cause them to have a decreased life space. Life space measures of how far a person travels outside of their room are typically selfreported, which may not be reliable in those with memory problems. In this study, real-time location tracking was used to calculate life space with derived variables of average Euclidean distance traveled each day, and the proportion of unique locations within the assisted living community visited. These were compared with self-report life space variables and MoCA assessment variables to determine the validity and redundancy of having multiple life space variables, and the relationship between them. MoCA was negatively correlated with the derived average distance life space variable. The self-report life space variable was positively correlated with the derived life space tracking variable.

HENRY HALL ATRIUM 063

Characterization of Inhibitors of ADC-33, a β-lactamase Variant Involved in Antibiotic Resistance

Participants attending 12:00 PM - 1:00 PM
Presenter: Zoe Ziegler
Mentor: Bradley Wallar

Antibiotic resistance in Acinetobacter baumannii is a global crisis that threatens the efficacy of current antibiotics. While multiple mechanisms exist to contribute to the resistance of antibiotics, one of the most prevalent is through β-lactamases which are enzymes able to bind and inactivate antibiotics. One type that A. baumannii expresses is Acinetobacter-derived cephalosporinases (ADCs). Recent studies have shown that ADC-33 gains the ability to bind and turn over larger cephalosporins, such as ceftazidime and cefiderocol. To overcome this increased resistance, inhibitors have been synthesized that are able to competitively bind to the enzyme, ultimately resulting in restored β-lactam antibiotic activity. A series of novel boronic acid transition state inhibitors (BATSIs) RDM03-06 were tested with ADC-33 via competition kinetic assays and exhibited Ki values between 0.25 - 2.30 μM. Additionally, X-ray crystal structures of ADC-33 in complex with RDM03-05 were determined to resolutions ranging from 1.49 - 1.61 Å. Characterization of the structure and function of these compounds will aid in the optimization of inhibitors that can bind and inhibit multiple ADC variants, and/or other classes of β-lactamases; a major advancement in fighting antibiotic resistance.

HENRY HALL ATRIUM 064

Estimated Number of Observed White Dwarf Binary Stars for LISA

Participants attending 11:00 AM - 12:00 PM
Presenter: Corey Wright
Mentor: Brett Bolen

A new era of in astrophysics has begun known as multimessenger astronomy. In multimessenger astronomy, astronomers study astronomical sources using different types of "messenger" particles such as photons, neutrinos, cosmic rays, and gravitational waves. LISA (Laser Interferometer Space Antenna) is a gravitational wave detector launching in 2034 that will detect gravitational waves in the millihertz frequency range. COSMIC (Compact Object Synthesis and Monte Carlo Investigation Code) is a rapid stellar population synthesis code which simulates the evolution of binary systems within a galaxy. We will analyze COSMIC data containing binary white dwarf systems which emit gravitational waves detectable by LISA and whose apparent magnitude in visible light is bright enough in the electromagnetic spectrum to be detectable by space-based telescopes.

HENRY HALL ATRIUM 065

Evaluating the Role of Iron Restriction on Staphylococcus lugdunensis Biofilm Formation and Subsequent Antibiotic Sensitivity

Participants attending 11:00 AM - 12:00 PM
Presenter: Linnea Baldori
Mentor: Kathryn Haley

Staphylococcus lugdunensis is a coagulase-negative Staphylococci that is a part of normal skin flora. This species has recently been discovered to be a causative agent of skin and soft tissue infections as well as more aggressive infections, including endocarditis, an infection of the heart valves. Withstanding the shearing forces present in the heart typically requires bacteria to form a biofilm, which is a complex community of bacteria attached to a surface through the production of an extracellular matrix. Expression of virulence genes, including those involved in biofilm formation, are often coordinated with environmental changes indicating pathogen entry into the host. One such environmental change is the availability of iron, as the human body is nearly devoid of free iron. Aggressive infections such as endocarditis require antibiotics for clearance. However, bacteria that are located within biofilms are more resistant to antibiotics and, therefore, more difficult to eliminate. Our project is focused on the role of iron availability in S. lugdunensis biofilm formation and any subsequent increased resistance to antibiotics. Medically relevant antibiotics such as erythromycin, cefazolin, and gentamicin will be added to the media in order to evaluate the antibiotic sensitivity of bacteria grown within a biofilm.

HENRY HALL ATRIUM 066

Geochemical Analyses of Carbonate Cements in West Michigan Glacial Sediments: Insight into Past Hydroclimate?

Participants attending 10:00 AM - 11:00 AM
Presenter: Owen McCaffrey
Mentor: Ian Winkelstern

The Pleistocene glacial deposits covering the upper US Midwest shape regional landscapes and hold important groundwater resources. These sediments are sporadically well-cemented, as noted anecdotally in outcropped and buried examples. Despite their significance, these geologically young rocks have received little scientific attention. The calcite cements within are of particular interest, due to their preservation of geochemical data which provide clues about the evolution of past hydroclimate conditions. Here we focus on a west Michigan locality at Lake Wabasis consisting of thick cemented glacial outwash. This is the first scientific study of these rocks, which are described colloquially as a “limestone cave”. We will present field observation, petrographic, XRD, and stable isotope data from a suite of rock samples, and one sampled speleothem currently precipitating within the cave. We use these data to evaluate whether the different phases of cement formed recently (with vadose cement and approximately modern stable isotope geochemistry), or instead occurred earlier during the Holocene/deglacial when the water table was likely higher (possibly resulting in phreatic cements and/or more negative δ18O). This work will place this unique outcrop in geologic context, enhance understanding of variability within glacial aquifers, and assist with evaluations of modern and past hydrologic models.

HENRY HALL ATRIUM 067

Addressing Grand Rapids’ Housing Crisis in the 2024 Master Plan

Participants attending 9:00 AM - 10:00 AM
Presenter: Avery Koan
Mentor: Susan Mendoza

For this presentation, I will be showcasing a portfolio of all the projects I have worked on this semester through my John H. Logie Fellowship through the City of Grand Rapids in their Planning Department. In addition, I took advantage of my access to data and connections with people in the department to create a research paper for my ENS 301 SWS ENS Methods course that will also be highlighted at this time. I wanted to capitalize on this amazing fellowship opportunity to develop a research project based on a pressing issue that Grand Rapids faces today: the housing crisis. There is no better time to address the housing shortages and crisis in Grand Rapids than now with the Planning Department updating their Master Plan this year. In this paper, I explain the methodology that the Planning Department utilized to conduct their three rounds of community engagement for the Master Plan updates. All in all, this research project allowed me to take advantage of my fellowship with the City of Grand Rapids and dive deeper into the housing crisis that is being addressed in the 2024 Master Plan.

HENRY HALL ATRIUM 068

Evaluating the Role of Iron Restriction on Staphylococcus lugdunensis Biofilm Formation and Subsequent Antibiotic Sensitivity

Participants attending 11:00 AM - 12:00 PM
Presenter: Mitchell Tiell
Mentor: Kathryn Haley

Staphylococcus lugdunensis is a coagulase-negative Staphylococci that is a part of normal skin flora. This species has recently been discovered to be a causative agent of skin and soft tissue infections as well as more aggressive infections, including endocarditis, an infection of the heart valves. Withstanding the shearing forces present in the

heart typically requires bacteria to form a biofilm, which is a complex community of bacteria attached to a surface through the production of an extracellular matrix. Expression of virulence genes, including those involved in biofilm formation, are often coordinated with environmental changes indicating pathogen entry into the host. One such environmental change is the availability of iron, as the human body is nearly devoid of free iron. Aggressive infections such as endocarditis require antibiotics for clearance. However, bacteria that are located within biofilms are more resistant to antibiotics and, therefore, more difficult to eliminate. Our project is focused on the role of iron availability in S. lugdunensis biofilm formation and any subsequent increased resistance to antibiotics. Medically relevant antibiotics such as erythromycin, cefazolin, and gentamicin will be added to the media in order to evaluate the antibiotic sensitivity of bacteria grown within a biofilm.

HENRY HALL ATRIUM 069

Spherical Easel: Application Design and Development Collaboration

Participants attending 11:00 AM - 12:00 PM
Presenter: Dat Nguyen
Mentors: Will Dickinson, Hans Dulimarta

Dat Nguyen

Spherical geometry literally surrounds us, but despite this fact, the American education system focuses on the teaching of Euclidean geometry and is supported by several web applications. To address this issue, Profs. Austin and Dickinson introduced Spherical Easel in 2004, a browser-based web application, to promote the teaching and learning of Spherical geometry. In 2020 Profs. Dickinson and Dulimarta began an update that concentrated primarily on the functionality of the application. During the summer of 2023, we focused on adding an Earth Mode feature and implementing a design team's recommendations to improve the application's usability. The Earth Mode displays the globe and allows users to explore the Earth in the context of spherical geometry. To implement this we used Three JS (a WebGL library for 3D graphics), and Google Place API to convert real addresses to geo-locations. The design team made user interface recommendations using Figma prototypes that we implemented. This successfully gives the application a new interface with better navigability and usability. This project was funded by the Student Summer Scholars Grant at Grand Valley State University.

HENRY HALL ATRIUM 070

Individual Differences in Motivation for Alcohol Use and its Associations with Self-esteem and Anxiety

Participants attending 2:00 PM - 3:00 PM
Presenter: Jack Lipscomb
Mentor: Christine Smith

Low stimulation of Gamma-aminobutyric acid (GABA) has been linked to anxiety and major depressive disorder. Alcohol stimulates GABA which leads to a decreased fear response. One can speculate that when consuming alcohol, the alleviation of some anxiety and depressive symptoms occurs. I hypothesize that individuals with low self-esteem and/or high levels of anxiety will be more aware of alcohol's inhibiting behavior effects. This study aims to analyze individuals' motivations for alcohol consumption. Data collection is underway amongst Grand Valley University students.

HENRY HALL ATRIUM 071

ERA Activism in West Michigan

Participants attending 9:00 AM - 10:00 AM
Presenters: Dorian Fedewa, Avery Koperski
Mentor: Nora Salas

This project will aim to aid in a better understanding of the Women's Movement in West Michigan. More specifically, it will focus on activism related to the ratification of the Equal Rights Amendment and how this activism impacted the Women's Movement in West Michigan. Ruth Stevens, an activist during the time of the Equal Rights Amendment, provided insight into this time period. With the help of Ruth Stevens and the sources she was able to provide, this research will deepen our understanding of the Equal Rights Amendment and activism among women in West Michigan.

HENRY HALL ATRIUM 072

Timeline and Study of the 20th century West Michigan Women's Movement

Participants attending 9:00 AM - 10:00 AM, 12:00 PM - 1:00 PM, 4:00 PM - 5:00 PM
Presenters: Julian Edouard, Michael Frait, Jason Hiegel
Mentor: Nora Salas

The movement to pass the Equal Rights Amendment (ERA) engulfed the United States during the late 20th century. Debate over the amendment would lead to much discussion and debate throughout the nation, including the West Michigan city of Grand Rapids. This study, using primary sources of oral testimony from women involved in the women's rights movement during the 1970s, photographs, newspaper articles, research studies and other collaborative methods, aims to shed greater light on a lesserresearched topic. The researchers hope to bring a fuller understanding to the fight to bring gender equality from the perspective of women who were directly involved in the Grand Rapids struggle.

HENRY HALL ATRIUM 073

Katherine Downes Lewis: Teacher, Activist, Woman

Participants attending 9:00 AM - 10:00 AM, 10:00 AM - 11:00 AM
Presenters: Travis Balog, Lauryn Comstock, Hannah Duran, Lindsay White
Mentor: Nora Salas

This project aims to provide a perspective of the life of Katherine Downes Lewis, a prominent Grand Rapids women's rights activist. An involved volunteer and former teacher, Katherine played a pivotal role in the push for the Equal Rights Amendment in Michigan. She has had an extensive thirty-five-year career as a teacher, primarily at Kenowa Hills High School. While teaching, she served as English Department Chair, North Central Chair, and

School Improvement Chair, and has since ascended to serve on the school board of Grand Rapids Public Schools.

HENRY HALL ATRIUM 074

Evaluating the Role of Iron Restriction on Staphylococcus lugdunensis Biofilm Formation and Subsequent Antibiotic Sensitivity

Participants attending 12:00 PM - 1:00 PM
Presenter: Angelina Avramenko
Mentor: Kathryn Haley

Staphylococcus lugdunensis is a coagulase-negative Staphylococci that is a part of normal skin flora. This species has recently been discovered to be a causative agent of skin and soft tissue infections as well as more aggressive infections, including endocarditis, an infection of the heart valves. Withstanding the shearing forces present in the heart typically requires bacteria to form a biofilm, which is a complex community of bacteria attached to a surface through the production of an extracellular matrix. Expression of virulence genes, including those involved in biofilm formation, are often coordinated with environmental changes indicating pathogen entry into the host. One such environmental change is the availability of iron, as the human body is nearly devoid of free iron. Aggressive infections such as endocarditis require antibiotics for clearance. However, bacteria that are located within biofilms are more resistant to antibiotics and, therefore, more difficult to eliminate. Our project is focused on the role of iron availability in S. lugdunensis biofilm formation and any subsequent increased resistance to antibiotics. Medically relevant antibiotics such as erythromycin, cefazolin, and gentamicin will be added to the media in order to evaluate the antibiotic sensitivity of bacteria grown within a biofilm.

HENRY HALL ATRIUM 075

A New Epithemia Species from Douglas Lake, Michigan

Participants attending 9:00 AM - 10:00 AM
Presenter: Ryan Ruppert
Mentors: Sarah Hamsher, Patrick Kociolek

Diatoms are single celled microalgae with silica cell walls. They produce 20-30% of the world’s oxygen, which is more than all the tropical rainforests combined. The Rhopalodies, an order of diatoms, are unique in their ability to host endosymbiotic cyanobacteria that fix nitrogen for them. This order includes species in the genera Epithemia, Rhopalodia, and Tetralunata. After observing samples from Douglas Lake, we uncovered a new species of Epithemia, similar to Epithemia reicheltii based on morphological characteristics. The purpose of our study is to describe this new species to science, based on light and scanning electron microscopy, and compare it to Epithemia reicheltii so it can be recognized in future studies.

HENRY HALL ATRIUM 076

Extending Voronoi Diagrams to Measure the Impact of Local Services on Individual Homes

Participants attending 1:00 PM - 2:00 PM, 2:00 PM - 3:00 PM, 3:00 PM - 4:00 PM
Presenter: Levi Klamer
Mentors: Byron DeVries, Dawn Rutecki

While the concept of "home" is complex, a simple definition could be one's physical residence, and the differences between these residences affects home quality. Specifically, the geographical location of a residence may be inequitably far from services needed for a safe and healthy home life. Just as individuals may experience differing levels of discrimination based on the intersectionality of their identities, we would posit that residences may apply unique levels of oppression to those that call them homes based on the availability of nearby services. Unfortunately, identifying regions geographically distant from such services is complex, especially when considering a variety of missing services. We have used novel algorithms in computational geometry to analyze the Grand Rapids area for: the distance to a variety of services necessary for safe and healthy homes, regions of high distance from a combination of those services, and optimal locations for new services using an extension of the Facility Location Problem. Our hope is that the generated data can be leveraged into a greater understanding of the social and economic disparities within the West Michigan area and how that disparity impacts the quality of residences as homes.

HENRY HALL ATRIUM 077

Live Testing for Safety-Critical Robotics Applications

Participants attending 9:00 AM - 10:00 AM
Presenter: Andrew Goodling
Mentor: Erik Fredericks

This project focuses on enhancing assurance for safety-critical robot applications via monitoring and testing its behaviors during execution. By employing techniques such as run-time software testing and monitoring alongside robot control systems, we aim to evaluate the robots' performance comprehensively. Our approach involves creating an experimental testbed for real-time software testing on physical robots, analyzing data collected during execution to assess overall performance and identify potential vulnerabilities. Additionally, we integrate fuzz testing as a proactive measure to uncover overlooked issues. The primary goal is to develop a robust framework for ensuring the reliable operation of safety-critical robots in real-world scenarios, advancing autonomy in critical applications.

HENRY HALL ATRIUM 078

The Effects of Landscape on Arthropod Community Structure in Pinecones

Participants attending 9:00 AM - 10:00 AM
Presenter: Denise Gardner
Mentors: Erin McNally-Goward, Stephen Rybczynski

Pine cones provide crucial habitat to arthropods, offering shelter, food, and breeding grounds. Despite this significance, there's an absence of research on how lawn care practices affect these communities (Turgeon, 2005). Studies indicate that lawn care practices such as mowing, and the use of pesticides and fertilizers can diminish

arthropod populations and diversity while promoting pest species in soil and ground cover (Proske, 2022; Axelsson, 1984). We are asking: Do lawn care practices influence arthropod diversity and pest abundance within pine cones? We sampled three sites for six cones each across the Grand Valley State University Allendale Campus. Arthropods were extracted using Berlese Funnels (Kulhavy, 1985), identified, and counted under magnification. A one-way ANOVA assessing order abundance revealed no significant differences among the locations ($p = 0.208$, $p = 0.173$, $p = 0.987$). Shannon's Diversity Index revealed the highest diversity on Manicured Lawns ($H = 1.033$), followed by Dense Pine ($H = 0.444$) and Diverse Forest ($H = 0.408$). These findings suggest that pine cones on manicured lawns may offer essential habitat for arthropods. Alternatively, pine tree skirts may maintain cone moisture and shield them from wind, creating a more favorable habitat on lawns.

HENRY HALL ATRIUM 079

Iron Complexes as Redox Electrolytes in Flow Batteries

Participants attending 1:00 PM - 2:00 PM
Presenter: Christina Jiang
Mentor: Andrew Lantz

Redox flow batteries have gained attention recently as potential large-scale, low-cost energy storage systems for environmentally friendly renewable energy sources. Energy is stored in these batteries by coupling two redox active species with a difference in reduction potential, which is related to the voltage output of the battery. Organometallic compounds are attractive electrolyte candidates since the reduction potential of a metal can be raised or lowered through binding with a ligand. Iron organometallic compounds are of particular interest due to the non-toxicity, abundance, and low price of iron. Here, reduction potentials and electrochemical characteristics of several iron organometallic compounds were studied and electrolyte pairs that show proper potentials and reversibility were then tested in a smallscale battery to assess their performance.

HENRY HALL ATRIUM 080

Isotachophoresis Method for Quantifying the Competitive Growth of Mixed Bacteria Cultures

Participants attending 1:00 PM - 2:00 PM
Presenter: Colton Dysart
Mentor: Andrew Lantz

Escherichia coli is a bacterium that is known for its gastrointestinal tract infections. Probiotics are often used to treat GI tract infections by introducing competing bacteria such as Lactobacillus and Bifidobacterium species. In this research, we develop a capillary electrophoresis method using sotachophoresis (ITP) to quantify E. coli growth in the presence of these competing bacteria. ITP uses an applied electric field to separate ions and cells within a capillary based on their electrophoretic mobilities. Escherichia coli and Lactobacillus casei were inoculated and incubated together, and this ITP method was then used to quantify the levels of each species present in solution. This ITP method may be used in the future to quantify other competitive growth systems and cell mixtures.

HENRY HALL ATRIUM 081

How Paralanguage Drives Advertising Impact

Participants attending 12:00 PM - 1:00 PM
Presenter: Alissa Sayavong
Mentor: Dan Brown

Paralanguage is the type of language that is used most by the marketing team in companies that make the public aware of their product. Research shows aspects of language through the ways of facial expression, voice quality, and the speed of the voice. Users of certain brands may have some sort of loyalty to one brand, so paralanguage can be impactful as messages of certain advertisements need credibility. This study will be able to help the public eye understand how paralanguage plays a role in successfully drawing attention in advertisements. A survey will be administered to students, to see what they gravitate towards when it comes to advertising, whether it's the voice, color scheme, tone of the voices or even the facial expressions used by the actors in the advertisement. Multiple companies with advertisements will also be evaluated by participants to compare the paralanguage strategies used by companies in their marketing. I anticipate finding various points in my research in order to educate the audience about various features of paralanguage and its effectiveness in drawing attention whether its targets are men, women, children, or the elderly audience.

HENRY HALL ATRIUM 082

Gendered Performance in Voice Acting

Participants attending 12:00 PM - 1:00 PM
Presenter: Madelyn Dwyer
Mentor: Dan Brown

The performance of gender is something that we partake in throughout our lives. In addition to this constant social performance, one can present gender intentionally in the performance arts, such as it is in plays, movies, audiobooks, etc. This phenomenon is especially interesting in voice acting, as it removes the visual denotation of gender, and allows one to focus solely on the linguistic aspect of this performance. The purpose of this study will be to examine the performance of gender in voice acting, and determine whether gendered linguistic features appear more in intentional performance than when one is speaking in one's natural voice, as well as whether these features will appear more often when performing a gender incongruous with one's own identity. The methods will consist of collecting audio interviews in which subjects are asked their age, gender identity, and if they have any experience voice acting, and then asked to record three short monologues, one as a masculine character, one as a feminine character, and one as a nonbinary character. Participants' natural voice will also be recorded as a baseline for comparison. These interviews will then be analyzed, and I will search for the presence of gendered linguistic features.

HENRY HALL ATRIUM 083

Differences in Perceptions of Vulgar Language Use by Gender

Participants attending 11:00 AM - 12:00 PM
Presenter: Lynnae Fisher
Mentor: Dan Brown

Research has shown a difference in people's perceptions of vulgar language use when it

is used by different genders. Studies show it is less accepted for a woman to use profanity than it is for a man using the same profanity (Mills, 2008). Less research exists that studies the effect that age and gender have on a person's perception of profanity used by women versus men. This study aims to explore not only the difference in perception based on the gender using profanity but also if there is a gender and age group that is more likely to have this perception shift. A survey of 30 individuals, varying in age and gender, will be conducted. The participants will listen to 6 audio clips featuring 3 scripts where a man and woman are using the same profanities. They will respond with how obscene the language used was utilizing a Likert scale and how they feel about the language used (short answer). The anticipated findings include a difference in perception, especially among age and gender ranges of participants. The hypothesis is that females aged above 45 will have a more negative view of women speaking taboo language

.

HENRY HALL ATRIUM 084

Intonation and Gender in Customer Service Settings

Participants attending 11:00 AM - 12:00 PM
Presenter: Jackson Hicks
Mentor: Dan Brown

There is an understood correlation between intonation and socially perceived notions of gender. Voices with a higher intonation are traditionally perceived as feminine, even if the voice of the individual speaking is not inherently feminine or does not identify as a woman or binary gender. The colloquially termed 'customer service voice' is meant to be inviting, friendly, and supportive for the customer and is a trained habit and learned voice within the service industry. This project aims to explore and observe customers' responses to different voices, examine which they deem more friendly, supportive, and 'nicer,' and why that is. To do so, the participants will listen to the same service-based interaction with the same script and point out which one they find more friendly, a higher-pitched voice or a lower-pitched voice from both a male and female service worker. The study anticipates that the lower intonations will be perceived as aggressive or disinterested or that customer service voice has no impact on perceived notions of gender as it relates to intonation.

HENRY HALL ATRIUM 085

Gendered Differences in discourse marker use: Taylor Swift and Bruno Mars

Participants attending 11:00 AM - 12:00 PM
Presenter: Courtney Hess
Mentor: Dan Brown

Discourse markers are a linguistic tool used to organize sentence structure within the spoken language. While the use of discourse markers has been heavily studied in the context of gender, this linguistic analysis will investigate how the use of discourse markers: such as "like, well, or I mean" can lead to societal bias - more specifically, how the speech of influential figures may reinforce stereotypes and biases against women. This study will compare Taylor Swift, the highest grossing musician on tour in 2023, who draws unwarranted criticism in the spotlight, and Bruno Mars, another extremely influential musician. This study will analyze their interviews as well as speeches throughout their respective careers in order to compare the quantity of gendered discourse markers used between the musicians - and aims to uncover how these linguistic tools could potentially lead to biases among the musicians. Anticipated findings will be that Taylor Swift uses more discourse markers that make her appear as 'smaller' (this could include a more frequented use of 'I think…'), whereas Bruno Mars will use more discourse markers that appeal to a sort of authority (such as 'how I see it…').

HENRY HALL ATRIUM 086

Gendered Linguistic Resources Used In Advertisements

Participants attending 12:00 PM - 1:00 PM
Presenter: Natalie Niehaus
Mentor: Dan Brown

Advertisements are seen everywhere, whether on TV, social media apps, or billboards, and can be highly influential, using certain tactics to appeal to the pathos of consumers. This research study will be used to explore how advertisements conform to gender stereotypes and use different linguistic resources to appeal to different genders. When gearing towards certain genders in advertisements, companies are appealing to the gender performance many humans feel the need to fulfill, but this can also be harmful, as the advertisements also conform and encourage gender stereotypes in society that aren't always true. This study will observe 30 different product advertisements, 15 "women-geared" and 15 "men-geared", and analyze what kinds of stereotypical discourses are used in "female" product-geared advertisements versus those used in "male" product-geared advertisements. The linguistic resources found will be recorded in a tally-like manner and examined at the end to see which were repeated, if any. The observations are hypothesized to result in more female-presenting linguistic resources used in the female-geared advertisements and more male-presenting linguistic features in male-geared advertisements, bringing awareness to the conformation to gender stereotypes in advertisements to hopefully encourage them to be more inclusive and equal.

HENRY HALL ATRIUM 087

Exploring the Effects of Chromosome Rearrangement on Gene Characteristics in Drosophila willistoni: A Comparative Genomics Approach

Participants attending 9:00 AM - 10:00 AM, 10:00 AM - 11:00 AM, 11:00 AM - 12:00 PM, 1:00 PM - 2:00 PM, 2:00 PM - 3:00 PM, 3:00 PM - 4:00 PM, 4:00 PM - 5:00 PM
Presenters: Kailani Acierto, Madison Atwood, Leonardo Balcazar, Danielle Brower, Taylor Grifhorst, Edwin Lopez Maldonado, Alyssa Oberly, Bushra Rashrash, Delaney Sacra, Ashlyn Tyson
Mentor: Martin Burg

Understanding how chromosomal rearrangements impact gene structure is vital for understanding processes that lead to evolution of a genome. This study aims to determine whether chromosomal rearrangement affects individual gene characteristics, such as gene rearrangements, inversions, or deletions, by focusing on the F/E Element chromosome fusion in Drosophila willistoni. By comparing the D. melanogaster F Element genes with the equivalent genes in D. willistoni, we aim to understand how moving chromosomal regions affect the characteristics

of F element genes. Using the D. willistoni PacBio genome assembly generated by the Genomics Education Partnership (GEP), the fused chromosome was partitioned into annotation projects, focusing on gene coding region annotation. From 7 F Elementspecific and 3 E Element-specific projects, we annotated the regions using a standard workflow, supported by the GEP. Employing bioinformatics tools like BLAST, FlyBase, the UCSC genome browser, and specialized tools with the support of the GEP, we annotated genes and verified alignment accuracy. To ensure accuracy, we also used experimental data that were integrated in the annotation, including tissuespecific RNA-Seq, to construct gene models for future meta-analysis conducted by the GEP. Ultimately, the results will begin to offer insights into the evolutionary implications of chromosomal restructuring on gene characteristics.

HENRY HALL ATRIUM 088

Emoji Expression Between Men and Women

Participants attending 9:00 AM - 10:00 AM
Presenter: Hannah Hutton
Mentor: Dan Brown

Emojis are often used in instant text messaging to convey the writer's tone and emotion. Emojis can represent a wide range of emotions, objects, activities, and symbols. Emojis have been around since 2011, and they are still shaping the way we communicate. Since there are over 3,600 emojis as of 2023, it is easy to misinterpret the meaning of many emojis. This study aims to identify how men and women interpret the meaning of the most commonly used emojis in direct text messaging. To better understand how the different genders associate meaning to certain emojis, I will conduct a survey. I will first ask 15 men and 15 women, ages 18-25 to submit their 5 most frequently used emojis. I will then survey a different group of 15 men and 15 women, ages 18-25 to describe a scenario in which they would use each of the 5 emojis, or if they would even use that emoji at all. I anticipate finding that women will use emojis more than men, and women will use emojis in a sincere way, like using a heart emoji to show an emotional connection, whereas men will use emojis to show their understanding of a message.

HENRY HALL ATRIUM 089

Gendered Language in Musicals

Participants attending 12:00 PM - 1:00 PM
Presenter: Gwendalyn LaComte
Mentor: Dan Brown

The words we use may seem like a natural happenstance, but they are a product of socialization. Research has suggested that there are differences in the use of lexical features between men and women (Eckert & McConnell-Ginet, 2013, p.70). Not only is our vocabulary cultivated at home, but also in the media we consume. Though studies have investigated gendered language in modern-day songs, there are fewer studies focused on musicals, which highlight both a visual and oral performance of gender. This study aims to explore how musicals could amplify gender stereotypes and influence the public's perception. The study will involve analyzing three musicals and two songs from each musical, each musical will be used to determine the extent to which gendered lexical differences between performances of men and women. To investigate public perception, surveys will be administered to show the public's perception: they will get a lyric from a musical and have to infer if it is traditionally sung by a man or woman. The anticipated results are that there will be a difference in gendered vocabulary use between men and women in musicals and that people taking the survey will be able to accurately guess which gender sang what lyric.

HENRY HALL ATRIUM 090

Among Us: 3rd Rock From the Sun and Measuring Gender Performativity

Participants attending 3:00 PM - 4:00 PM
Presenter: Robert Hyma
Mentor: Dan Brown

A variety of linguistic features have been linked to women's usage, such as uptalk, hedging, adding tag questions, politeness strategies ("Could you possibly…?), etc. These linguistic usages have been associated with power dynamics and how society expects women to behave (Eckert & McConnell-Ginet, 2013). While previous studies have used the medium of television to discuss women's gender roles and performativity, there is room to conduct further research from a non-binary character perspective. This study intends to explore non-binary perspectives centering on the television show 3rd Rock From the Sun, which features an alien family blending into smalltown American culture. We will explore four episodes featuring Sally, the lieutenant and security officer, and her attempts to blend into female society. We will analyze the number of gendered linguistic features at the beginning of each episode, during her time blending in with the women of the show, and how she speaks by the end of each episode to measure the differences in linguistic gender performativity. We anticipate results of this study will show an increase in uptalk, hedging, tag questions, etc. in the middle of each episode, while declining towards the end when she is relieved of this role.

HENRY HALL ATRIUM 091

Codeswitching and Its Use Among Black Women in Corporate America

Participants attending 1:00 PM - 2:00 PM
Presenter: Jada Thomas
Mentor: Dan Brown

Codeswitching is the phenomenon of alternating between two or more dialects or languages in certain contexts or conversations. In the African-American community, individuals often codeswitch between African-American English (AAE) and General American English (GAE) dialects to adjust to particular social contexts. There appears to be a scarce amount of information on the extent to which highly successful Black women make use of codeswitching in professional contexts, and if they do, how or why it is used. In this study, the intention is to highlight whether or not Black women in highly influential positions codeswitch and how they may incorporate features of AAE in their formal dialogue. To conduct this, publicly available interviews of Black women CEOs and entrepreneurs will be analyzed for their employment of codeswitching and their use of AAE. The data collected from these interviews may indicate that Black women in influential positions typically use GAE and rarely codeswitch into AAE when employing formal dialogue. Additionally, Black women who do employ AAE in their formal dialogue may be perceived as being less professional than the Black women who do not employ AAE and thus may be less successful than them.

HENRY HALL ATRIUM 092

What's Your, Uh, Gender: An Examination of Perceived Gender via Usage of Pause Fillers

Participants attending 9:00 AM - 10:00 AM
Presenter: Samuel Scroggins
Mentor: Dan Brown

Previous work on pause fillers shows that for cisgender speakers, men tend to use uh more and women tend to use um more. Forthcoming research indicates that nonbinary people use (UHM) at rates similar to those of cisgender speakers of the same gender-assigned-at-birth, suggesting that (UHM) is nonsalient (since previous work regarding nonbinary speakers indicates that for salient variables they do not follow cisgender patterns). The question then rises: if (UHM) is nonsalient, how can children learn its gendered patterning? This study aims to investigate this by examining whether people perceive speakers' genders differently depending on the (UHM) variant they use. After collecting one recording each from three speakers of the same passage (one with a "feminine" voice, one "masculine", and one "androgynous"), I will insert instances of (UHM) into their speech, providing nine recordings in total (one with um, one with uh, and one with no fillers). I will distribute a survey; participants will be randomly assigned to one recording and asked to judge the speaker's "masculinity" or "femininity" on a visual analogue scale. I anticipate that, if (UHM) is truly nonsalient, there will be no difference in the judgments based on (UHM) variant.

HENRY HALL ATRIUM 093

Gendered Questioning of Celebrities

Participants attending 10:00 AM - 11:00 AM
Presenter: Alison Dreese
Mentor: Dan Brown

In award shows and movie promotions men and women receive different questions when they are interviewed. I want to look into what gender-geared questions celebrities are asked. Men, most of the time, are asked more professional questions, such as composition of the film, whereas women are more likely to be asked about romance scenes, clothing, or even their bodies. I want to bring awareness to the unjust questions that both men and women are asked when talking about a film they are in. In order to do this I will look at interviews from different genres of movies, including horror, action, romance and comedy. Then I will look into lexical topics (clothing, jewelry, relationships vs. stunts, strength training, production) that are gender-stereotyped, and then count each instance of the topic for each gender. I will then put it into a ratio to find what topics come up more for men or women. I believe topics such as beauty, clothing, relationships and so on will be geared towards women. I believe topics such as stunts, danger, film composition and so on will be geared towards men.

HENRY HALL ATRIUM 094

"I Now Pronouns You" They and Them: Perceived Inclusion within Gender-Neutral Language by Gender Identity

Participants attending 9:00 AM - 10:00 AM, 10:00 AM - 11:00 AM
Presenter: Lex Larkspur
Mentor: Dan Brown

While personal pronouns have long existed in English, the rising prominence of trans identity has made changing one's pronouns and displaying one's pronouns a more prominent concept. Because transgender people's experiences sometimes involve the rejection of assigned labels, their gender identity may be newer to them but also may make their identity feel more personally chosen. Past research has shown that gender-neutral language is increasingly perceived as inclusive in a general sense, but many reject the use of they/them pronouns for subjects with known binary gender, partially because it may be perceived as erasing identity. This study aims to discover how transgender and cisgender people who use gendered pronouns respond to being referred to with gender-neutral pronouns and how their responses may reflect attachment to gendered pronouns. To determine this, surveys will be administered that refer to respondents with various neutral pronouns and respondents will reflect on whether they feel included or erased through the use of neutral language. It is anticipated that those with binary identities will be the least receptive to use of they/them to refer to known recipients while non-binary or gender nonconforming individuals will be more open toward using neutral pronouns for all.

HENRY HALL ATRIUM 095

Interactive Evolution of Generative Art

Participants attending 11:00 AM - 12:00 PM
Presenter: Abigail Diller
Mentor: Erik Fredericks

Generative art is a domain in which artistic output is created via algorithmic design, where a generative artist will act as a domain expert by specifying the algorithms and parameters that will create the artwork. Often much time and effort are spent refining the parameters and/or algorithms to achieve the desired final output. GenerativeGI is an evolutionary computation-based technique for creating generative art by automatically searching through combinations of artistic techniques and parameters to produce outputs that reflect a desired aesthetic preference. However, computational aesthetic evaluation is highly challenging and often necessitates human evaluation. We extend GenerativeGI by leveraging human feedback to guide the evolutionary process and further enhance the novelty and aesthetic appeal of evolved images.

HENRY HALL ATRIUM 096

I Hear You Loud and Queer

Participants attending 12:00 PM - 1:00 PM
Presenter: Catherine Battaglia
Mentor: Dan Brown

Discrimination against someone based on the idea that their voice fits into a category one deems stereotypically "masculine" or "feminine" is seen often throughout the LGBTQ community. Many queer people (specifically lesbians and gay men) are perceived to use specific discourse markers and speech patterns. Several studies have been conducted that contribute to the identification of the speaker's sexuality, which is often referred to as "auditory gaydar" (e.g. Fasoli and Maass 2018). This study aims to contribute to this line of research and explore whether or not there are truly significant detectable differences in the voices of lesbians, gay men, and straight men and women.

To explore this I will view videos of openly queer celebrities, and compare them to their straight counterparts. I will be investigating features that have long been associated with the “gay” or “lesbian” voice and tallying them up for each of the viewed videos in hopes of making a descriptive comparison between each speaker based on their sexual orientation alone. It is anticipated that there will be differences between each of these speakers differences, but I do not expect it to be that major of a difference.

HENRY HALL ATRIUM 097

Bacterial Contamination of Patient Specimens

Participants attending 10:00 AM - 11:00 AM, 11:00 AM - 12:00 PM, 12:00 PM - 1:00 PM
Presenters: Kyle Beachnau, Molly Mitchell, Austin Thornburg
Mentor: Dana Vaughan

The introduction of bacterial contamination into patient specimens can present a large barrier when it comes to patients getting proper care. Our data has been compiled from various peer reviewed articles. We used both GVSU libraries and PubMed to find articles with keywords such as “bacterial contamination,” “specimen contamination,” and “proper specimen collection.” Our research discusses different ways that bacterial contamination can occur in a patient sample, as well as various ways it can be prevented. Bacterially contaminated specimens can alter patient results leading to improper treatment and unnecessary interventions in the patient’s care. The goal of this presentation is to educate students, future healthcare workers, medical laboratory scientists, and potential patients on the consequences of bacterial contamination and how it plays an integral role in patient care.

HENRY HALL ATRIUM 098

Gendered Language and Performance in Stand-Up Comedy

Participants attending 12:00 PM - 1:00 PM
Presenter: Michaela Christie
Mentor: Dan Brown

Gender inequality is prolific within traditional humor practices, but research seldom addresses the linguistic and performative differences between male and female comedians. One study compared the use of gendered language by male and female comedians (Cook et al. 2022), finding that female comedians used gendered nouns and pronouns when describing themselves and talked about same-gender topics more than male comedians. There is little research into specific linguistic features and how these subvert or reinforce gender stereotypes. This study aims to shed further light on gendered language use in standup comedy and how stereotypes are subverted or reinforced through linguistic performance. To explore gendered language in stand-up comedy, this study will focus on relevant comedians (both male and female) and compare their use of linguistic features. 30 videos of different comedians (15 male and 15 female) with various comic styles will be identified and analyzed for linguistic features and patterns. These features and patterns will then be analyzed for their relationship to gender stereotypes. It is anticipated that the study will reveal differences in the linguistic features between male and female comics and the performance of gender. These differences may provide insight into the negative stereotypes associated with female comics.

HENRY HALL ATRIUM 099

Improvements in Interprofessional Coordination, Data Collection, and Grant Deliverables

Participants attending 1:00 PM - 2:00 PM
Presenter: Mary Claire Meimers
Mentor: Della Hughes-Carter

An integrated primary care practice struggled to adequately capture patient outcome data. One Research Assistant (RA) completed a project assessment one year into a two-year grant-funded project, finding over 300 missing data points in 105 patient charts, and prompting a subsequent quality improvement (QI) initiative. The RA implemented process changes using the Plan, Do, Study, Act framework, including 1) facilitating interprofessional meetings to create shared, outcome-based goals; 2) constructing a mechanism to request primary care follow-up; 3) creating a tool to standardized patient-centered conferences; and 4) introducing patient Intake and Follow-Up forms. Ultimately, the capture rate of data improved. Quantitative depression screening rates, measured using the PHQ-9 tool, increased by a relative change of 34.7% (58/81 to 95/98 complete); quantitative anxiety screening rates, measured using the GAD-7 tool, increased by a relative change of 33.3% (58/81 to 94/98 complete); and substance use disorder screening rates, measured using the CAGE-AID tool, increased by a relative change of 52.1% (39/81 to 72/98 complete). Improvements in data collection allowed for statistical analysis. The RA was then able to support results dissemination at a national conference hosted by American Association of Colleges of Nursing (AACN), and through a high-impact journal submission.

HENRY HALL ATRIUM 100

Using Normal Mode Analysis to Compare the Conformational Changes Induced by Diazepam and Flumenazil in the α1-β2-γ2 GABA(A) Receptor

Participants attending 12:00 PM - 1:00 PM
Presenter: Amber Heist
Mentor: Agnieszka Szarecka

GABA signaling, concentrated in the brain's prefrontal cortex, is important for mental and emotional health. GABA(A) receptors are CYS-loop, neurotransmitter-gated, chloride-specific ion channels. They are pharmacological targets, primarily for benzodiazepines (BZD), Z-drugs, and barbiturates. It has been established that benzodiazepines act as allosteric agonists of GABA(A)R; however, the exact conformational changes that are induced by various allosteric modulators are not well understood. In this study, we used Normal Mode Analysis / Elastic Network Model to analyze the conformational changes induced by diazepam (BZD) and flumenazil (BZD antagonist) in the human GABA(A) α1-β2-γ2 receptor compared to GABA-bound receptor. Our data, collected for the three slowest modes and calculated for structures 6x3x, 6x3z, and 6x3u indicate that diazepam induces greater changes in receptor flexibility than flumenazil when both are compared to GABA-only bound receptor. Both flumenazil and diazepam affect the transmembrane domain in the slowest vibrational mode. In contrast, drug binding affects both transmembrane and extracellular domain residues in the second slowest mode. The second slowest mode also reveals residues near the γ-α interface that are affected similarly by diazepam and flumenazil. These results contribute to our under-

standing of the allosteric modulation of GABA(A)R by anxiolytic drugs.

HENRY HALL ATRIUM 101

End-to-end Development of an AI Web Application for Healthcare

Participants attending 9:00 AM - 10:00 AM
Presenters: Unai Amilleta Gonzalez, Marcos Diaz Puerta, Aliah Lloyd, Gautam Subedi
Mentor: Zachary DeBruine

We are building a web application to serve a new Artificial Intelligence (AI) model for healthcare that is easy to use and for clinicians. To build this web application, we have developed an innovative pipeline bridging data, an AI mo el, and a user-friendly web dashboard. Our dashboard focuses on characterizing patient data through clear graphical and statistical views of organs, genes, and cell types that our model predicts to be most affected in this patient. Results empower clinicians to discern over- or underexpressed genes in a patient sample, facilitated by differential expression analysis. The user-friendly dashboard receives results from our High-Performance Computing Cluster (HPC) that runs our AI model outputs into JSON format, which we use to generate common visualizations like volcano plots and bar charts, allowing for dynamic data exploration. This work establishes a functional pipeline and website, offering seamless integration of data and AI technologies, with significant implications for personalized healthcare insights and prioritization of phenotype screening for rare disease patients.

HENRY HALL ATRIUM 102

What Distinguising Features of Mycobacterium tuberculosis Cause Global Health Concerns?

Participants attending 9:00 AM - 10:00 AM, 10:00 AM - 11:00 AM
Presenters: Ahmed Hassan, Mesfin Teshome, Kelli VanDyke
Mentor: Dana Vaughan

Our poster presentation focuses on Mycobacterium tuberculosis (MTB). Various published articles on MTB were reviewed, and the mechanisms of pathogenicity, diagnostic techniques, and main factors of drug resistance mechanisms were investigated and explained. MTB is a bacterial disease that is constantly challenging global health systems. For example, in 2017 about 10 million new cases of TB with 1.6 million deaths were reported globally (Ezeonu et al, 2022). The morbidity and mortality rate of patients who develop active disease remains a major cocern, particularly for immunocompromised patients and those with low socioeconomic status. Our poster investigates the unique features of Mycobacterium tuberculosis pathophysiology, diagnosis, and treatment. Understanding the pathogenesis, drug resistance, and diagnostic techniques of Mycobacterium tuberculosis is critical for controlling the mortality and morbidity of infected patients.

HENRY HALL ATRIUM 103

Welcome, Traveler

Participants attending 9:00 AM - 10:00 AM
Presenter: Claire West
Mentor: Drew Pettinga

What does time mean to you? I focused on displaying the interconnectedness of all and the growth that comes from our movement through time. In my belief, time does not have a set beginning and end; instead, everything is interconnected. Our past and present affect our future, and with no straight lines in this piece I was able to bring this interconnected vision to life. The work flows into itself continuously. The deeper you look into it, the more life you see growing. It is existential, however interesting, to ponder how every living thing experiencing time is affected by everything else in the same environment. By opening a passageway for these connections, we have the ability to be in tune with our past, present, and future. While we all hold different beliefs, I invite the viewer to consider the effect time has on us as humans and on nature, as a whole.

KIRKHOF CENTER GRR 001

Monitoring Periphyton Growth in Response to Treatments that Control Cyanobacterial Blooms

Participants attending 11:00 AM - 12:00 PM
Presenter: Allison Romanski
Mentor: Alan Steinman

Common methods of treating harmful algal blooms (HABs), specifically Microcystis, include using copper sulfate or hydrogen peroxide. While these methods are effective at eliminating blooms, when the Microcystis is killed, it releases a toxin called Microcystin that can negatively impact other aquatic species. A new method has recently been published that investigated if the addition of glucose one week before the bloom occurs can prevent its formation. The goal of my work at AWRI is to see how another important aquatic community, Periphyton, responds to the additions of hydrogen peroxide and glucose to understand how these treatments affect the growth of other photosynthetic organisms. The samples were analyzed by measuring ash free dry mass (AFDM) and chlorophyll α. The results of the AFDM analysis and chlorophyll α analysis showed that, in regard to the tanks with treatments added, the tank with the highest concentration of glucose had the most organic matter and photosynthetic content.

KIRKHOF CENTER GRR 002

Mechanical Injury in Crayfish - A Further Exploration

Participants attending 2:00 PM - 3:00 PM
Presenters: Patrick Baumann, Colin Carter, Jonathan McCabe
Mentor: Daniel Bergman

The capacity to encode noxious stimulus, nociception, has long been thought to be absent or greatly reduced in invertebrates. However, more recent studies have begun to argue against this paradigm due to behavioral observations. Studies in Procambarus clarkii have shown nociception to high heat, resulting in escape behavior such as tail flipping away from the stimulus (Puri, 2014). Studies in crabs, such as Cancer pagurus, have shown that competitive behavior in males is significantly decreased when appendages were torn off and actions like rubbing the wound markedly increased (McCambridge, 2016). Our study utilizes similar mechanical injuries to crayfish and observes changes in their ability to find food. This project is a further exploration of research completed last year. Damage is done strictly to the carapace, and we have also begun to integrate endolymph draws to better understand the crayfish's physiological response

KIRKHOF CENTER GRR 003

Evaluating Possible Model Changes for the United States Healthcare System and Identifying Potential Obstacles to Change

Participants attending 2:00 PM - 3:00 PM
Presenter: Brooke Hoyt
Mentor: Anna Hammersmith

This study builds off of previous research on different countries' healthcare systems. This study aims to answer the question: if the United States were to change its healthcare system, what system would be the best fit? Current studies describe that the United States spends the most GDP on healthcare compared to any country in the world. Researchers note that the United States has large under or uninsured populations, suggesting money spent on healthcare is not being used efficiently. Many studies fail to provide modern solutions for how to address the issues at hand. This study will explore alternatives to the current healthcare system in the USA, by reviewing data and systems from other developed countries. This study will address potential obstacles that could occur if changes were to take place. This study will examine surveys completed by fifty-six Grand Valley State University students in a Sociology of Healthcare class. Those surveyed evaluated their satisfaction and beliefs regarding the United States healthcare system after they learned about it in class. The data from the surveys were analyzed and the implications of the results are discussed, including identifying potential barriers to changing the United States' healthcare system as well as possible solutions.

KIRKHOF CENTER GRR 004

Detection of Near-Earth Asteroids Using the LISA Spacecraft

Participants attending 9:00 AM - 10:00 AM
Presenter: Nicholas Ford
Mentor: Brett Bolen

In this project, I will examine a secondary of the European Space Agency's future space mission, the Laser Interfe ometer Space Antenna (LISA), as an asteroid detection device. To this end, I will create a simulation of the LISA spacecraft and an asteroid with variable mass and orbit. To analyze the model and the detection of the asteroid, I will measure the gravitational acceleration of each individual spacecraft due to the asteroid using the orbital parameters of various known asteroids. Using this data, I will examine the influence of mass and closest-approach distance on the gravitational force applied to the spacecraft. Based on my simulation results and analysis, I will determine the validity of this use case of LISA. If LISA can reasonably be used in this manner, I will report the limitations found in testing. With a positive yield of data, this project can contribute to filling NASA's Small-Body Database and give LISA the secondary purpose of detecting asteroid threats to Earth.

KIRKHOF CENTER GRR 005

The Use of Anxiolytic Drugs for Treatment of Anxiety in Adolescence Compared to Holistic Methods: A Systematic Review

Participants attending 9:00 AM - 10:00 AM
Presenters: Jessica Dole, John Gorzynski, Terin Hieftje, Hope Hopkins
Mentor: Chad Sutliffe

Increased numbers of adolescents experience anxiety or its symptoms. The objective of this systematic review was to determine if anxiolytic drugs or holistic therapies are better for treating anxiety in adolescents (ages 13-18). The findings show evidence for both methods being effective; however due to the long list of variability among adolescent individuals, there is not a one-size-fits-all approach to treating anxiety. We found the strongest evidence for individuals to embrace a mixed method for treatment consisting of finding a balance between the use of holistic treatment methods and the use of anxiolytic drugs.

KIRKHOF CENTER GRR 006

Biochemical and Structural Characterization of Aminoglycoside-O-Nucleotidyltransferase6Ib from Campylobacter fetus

Participants attending 10:00 AM - 11:00 AM, 11:00 AM - 12:00 PM
Presenter: Pranav Nalam
Mentor: Brian Smith

Aminoglycosides are a class of antibiotics that function by impairing protein synthesis in bacteria. However, the rise in antibiotic resistance has significantly reduced the efficacy of these drugs. The most common method of antibiotic resistance to aminoglycosides is via enzymatic modification of the antibiotic. The bacterial enzyme ANT6Ib employs this strategy to transfer an adenosine monophosphate (AMP) from ATP to the antibiotic. This modification alters the structure of the antibiotic, thereby hindering its capability to bind to its target, the bacterial ribosome. Despite the significance of this enzymatic activity, ANT6Ib has not been well characterized. Here, using MIC assays and steady-state kinetics, we biochemically characterized the ANT6Ib enzyme from Campylobacter fetus. Furthermore, we solved the structure of ANT6Ib to a resolution of 1.7 Å using protein crystallography and x-ray diffraction. Advancement of our understanding of the molecular mechanism of ANT6Ib can elucidate better methods of repressing aminoglycoside resistance.

KIRKHOF CENTER GRR 007

Numerically Modeling the Penrose Process

Participants attending 11:00 AM - 12:00 PM
Presenter: Ryan Childers
Mentor: Benjamin Holder

This project aims to first and foremost aid us in gaining a better understanding of general relativity as a whole as well as some more complex topics such as curved spacetimes, the Einstein field equations, and the geodesic equation. We would also like to use this understanding to develop a simulation tool to model the Penrose Process. This is a phenomenon involving the extraction of energy from a rotating black hole via its ergosphere: the region of space directly outside the event horizon in which all objects cannot stay stationary due to the influence of gravity. The Penrose Process was initially proposed in 1969 by Roger Penrose and was evolved to its current state by subsequent researchers. By simulating this process, we hope to better understand the complex dynamics near rotating black holes. Additionally, an accurate model could provide a deeper insight into how these black holes interact with the surrounding spacetime. The simulation tool will also be adaptable, allowing it to be used for various other mod-

eling-based investigations into black hole physics.

KIRKHOF CENTER GRR 008

Mindfulness Skills in the Classroom

Participants attending 4:00 PM - 5:00 PM
Presenter: Taylor Howell
Mentor: Jamie Langlois

It has been well documented that we as a nation, and as a globe, are facing a mental health crisis. Rates of depression, anxiety, and mental disorders in general have skyrocketed in the past decade, according to the APA. A problem of this scale is a difficult one to approach, yet research indicates that mindfulness and meditation show much promise in school settings. For this project, I teamed up with a licensed school social worker at Orchard View Elementary to create a curriculum that equips students with several mindfulness skills, including meditation and guided breathing, in the classroom. The mission is to provide students of all backgrounds with positive coping skills, like mindful awareness, that can be used to help better self-regulate anytime, anywhere. The mental health crisis is not waning; mindfulness curriculum implementation has the potential to create ripple effects on teachers and students' mental health and beyond into all aspects of life.

KIRKHOF CENTER GRR 009

Expanding Interfaces: A New Look for a New Application

Participants attending 11:00 AM - 12:00 PM
Presenter: Hannah Cline
Mentors: Will Dickinson, Vinicius Rebello Lima

Despite the prevalence of Euclidean geometry in American education, Spherical Easel, a browser-based application introduced in 2004, aims to promote the teaching of spherical geometry. While an updated version was initiated in 2020 to address user-centric concerns, it still prioritizes individual feature development over overall user experience. This project focuses on reconstructing the application's interface for enhanced usability and flexibility. Following a heuristic analysis, a new interface direction emerged to optimize usability for the international user base. Collaboratively, a student designer and developer are implementing this new design, requiring efficient communication. Using a Vue-based web application primarily in Typescript, specific components are ready for implementation. Although the design is not final, notable enhancements have been made to the graphical interface. This project is supported by the Student Summer Scholars grant from the Grand Valley State University Office of Undergraduate Research and Scholarship.

KIRKHOF CENTER GRR 010

An Exploration of Misophonia in the Literature

Participants attending 12:00 PM - 1:00 PM
Presenter: Megan Singer
Mentor: Cara Singer

Misophonia elicits an extreme negative reaction to specific auditory and visual stimuli. Triggers, which are often human produced, provoke an array of symptoms which include heightened negative emotions and autonomic nervous system responses. Despite being a relatively common disorder, misophonia is still inadequately recognized and is often classified under conditions like obsessive compulsive disorder, anxiety, posttraumatic stress disorder, and depression. No cure for misophonia currently exists, but there are many treatments and coping mechanisms used by people with misophonia to ease their triggers and symptoms. This comprehensive review synthesizes current research on misophonia, exploring underlying mechanisms, diagnostic methodologies, comorbidities, and treatment efficacy. By combining valuable insights, this review aims to enhance awareness and understanding of this often-overlooked disorder.

KIRKHOF CENTER GRR 011

Exploring Speech Language Pathologist's Practices Related to Acknowledging Stuttering with Preschoolers

Participants attending 10:00 AM - 11:00 AM
Presenter: Maisley Kreger
Mentor: Cara Singer

This survey study explores perspectives and personal experiences of Speech-Language Pathologists (SLP) about acknowledging the stuttering of young children. Certified SLPs in the United States were eligible to participate. Recruitment materials were distributed via social media flyers, and by the National Stuttering Association's Research Committee (NSARC) via a website feature and email blast. The survey was completed anonymously via an online RedCap survey. The survey included multiple choice and short answer questions aimed to better understand the perspectives and knowledge of SLPs regarding whether they explicitly address a young child's stuttering and how they instruct caregivers to respond to the child's stuttering. This study serves as a preliminary step into better understanding of how SLPs can discuss, educate, and potentially foster more positive attitudes towards communication of young children who stutter.

KIRKHOF CENTER GRR 012

Acute Microvascular Changes in Lower Leg Ffrom Pedaling while Playing Video Games

Participants attending 2:00 PM - 3:00 PM, 3:00 PM - 4:00 PM, 4:00 PM - 5:00 PM
Presenter: Madalyn Hickey
Mentor: Nicholas Lerma

BACKGROUND: Professional gamers accumulate up to 5.5 to 10 hours per day of gaming that takes place during uninterrupted sitting. PURPOSE: The purpose of this study is to analyze lower limb muscle oxygenation and blood flow patterns of sedentary behavior interruptions in seated video gaming. METHODS: In two visits, participants played 60 minutes of a video game. During one of the visits participants performed two 3-minute light intensity seated pedaling interruptions during game play. A near-infrared spectroscopy device was applied to the tibialis anterior (TA) to measure total hemoglobin concentration (THb) and muscle oxygenation (SmO2%). A one-way repeated measures ANOVA was performed for SmO2 and THb during the gaming period. RESULTS: Eleven males and two females (age 22.5 ± 6.0) participated. There was a significant time effect for THb during the 60 minute gaming peri-

od with pedaling interruptions (p = .018), but not for the non-pedaling day. Specifically, the final 2 minutes of the pedaling bouts included a significant reduction in THb (difference = -0.175 ± 0.06 g/dL). CONCLUSION: Pedaling specific reductions in THb indicates a measurable reversal in lower leg blood pooling. Periodic, light intensity pedaling may help to reduce VTE risk during uninterrupted gaming.

KIRKHOF CENTER GRR 013

Preserve or Modify? The Challenge of Accessible Outdoor Recreation

Participants attending 2:00 PM - 3:00 PM
Presenter: Alexis Phillips
Mentor: Amanda Buday

The line between keeping the environment preserved and modifying it to be compliant with the Americans with Disabilities Act seems to be unclear. While it is important to maintain natural habitats, providing equitable access for individuals with mobility disabilities is also necessary. This study explores arguments for both sides of the issue, keeping the positive effects of experiencing nature in mind. The reasons for both sides of the argument are valid, so the solution to this issue is unknown and complicated. Surveys were sent to residents in the Crockery Creek and Pentwater watersheds, to gather their opinions about the accessibility of parks in their respective watershed. Responses from these surveys were evaluated, with the findings that some residents strongly feel that trails should be kept in their natural state, while others appreciated paved trails and paths, which improve accessibility.

KIRKHOF CENTER GRR 014

Impact of Nuclear Level Densities on Astrophysical Reaction Rates

Participants attending 10:00 AM - 11:00 AM, 11:00 AM - 12:00 PM
Presenter: Grace Kessler
Mentor: Sofia Karampagia

Nuclear Level Densities (NLDs) are key inputs for calculating reaction rates for uses in astro- physics, medical physics, and industry. The NLD is defined as the number of energy levels per energy interval for a nucleus, which increases as energy increases. We will calculate NLDs for various energy levels using the Moments Method. We will then use our results and the program TALYS in order to calculate nuclear reaction rates in astrophysical environments. More specifically, we will calculate the cross sections of (n,γ) reactions, describing the probabilities of the reaction occurring under given conditions. These reactions take place in environments with an abundance of neutrons, such as neutron stars, core collapse supernovas, and neutron star mergers. We will compare our cross section results from TALYS with available experimental data as well as other theoretical models, including the Fermi-gas model and the Constant Temperature model.

KIRKHOF CENTER GRR 015

Effect of Brief Pedaling Bouts During One Hour of Video Game Play on Popliteal Artery Diameter and Velocity

Participants attending 9:00 AM - 10:00 AM, 10:00 AM - 11:00 AM, 11:00 AM - 12:00 PM, 12:00 PM - 1:00 PM, 1:00 PM - 2:00 PM, 2:00 PM - 3:00 PM, 3:00 PM - 4:00 PM, 4:00 PM - 5:00 PM
Presenters: Macey Dunn, Elizabeth Snelling
Mentor: Nicholas Lerma

BACKGROUND: In the United States, video gamers typically spend an average of 7.5 hours per week playing video games. Playing in a sedentary behavior is linked to obesity, decreased musculoskeletal, endothelial, and cardiovascular health. PURPOSE: The purpose of this study is to determine how light physical activity interruptions in video game-related sedentary behavior impact popliteal artery diameter (PD) and blood artery velocity (PV). METHODS: Eleven healthy college-aged participants were recruited to participate in a randomized crossover study. During two visits, participants engaged in 60 minutes of seated, first-person shooter video games. One visit was randomly selected to perform two 3-minute seated pedaling bouts within 60 minutes of gaming. Vascular imaging of the popliteal artery was captured to obtain PD and PV. One-way ANOVA was performed to determine differences by time and treatment. RESULTS: There was a significant group by time interaction for blood velocity, but not arterial diameter. Specifically, non-pedaling day velocity was significantly reduced compared to pedaling days. CONCLUSION: Prolonged bouts of sitting can induce significant reductions in lower limb blood flow and periodic pedaling breaks may prevent these changes.

KIRKHOF CENTER GRR 016

Synthesis of Novel Antibiotics to Treat Tuberculosis

Participants attending 9:00 AM - 10:00 AM
Presenter: Jonathan Bajko
Mentor: Matthew Hart

Tuberculosis (TB) is the second leading cause of death from infectious diseases worldwide. The World Health Organization estimates that 10.6 million people fell ill with TB in 2021, 1.6 million of whom died. The recommended treatment requires a combination of four drugs and takes 6 to 12 months to complete. Unfortunately, drug-resistant forms of TB have emerged due to this long course of treatment and lack of proper healthcare in developing countries. This has increased the need for novel treatments for TB. Previously, our group had developed several novel Diphenyl Ureas (DPU) that were active against Mycobacterium smegmatis, a bacterium similar to TB. Herein we report the synthesis, computational evaluation, and biological activity of new DPU variations to establish an SAR for these structures. The current targets examine a variable amine chain and the inclusion of an aryl fluoride. Using AutoDock Vina, the binding energies will be calculated. Establishing a link between these docking results and biological results may help in the development of novel drugs to treat TB.

KIRKHOF CENTER GRR 017

Whats on the Menu? Autonomy in Treatment Decision Making

Participants attending 1:00 PM - 2:00 PM
Presenter: Jonathan McCabe
Mentor: Alycia LaGuardia-LoBianco

Autonomy is a central principle in how we understand healthcare decision-making. Particularly in the US, we grant the patient (or close family members if the patient cannot) the right to choose the treatmentpath they would like to proceed with. This type of liberty bears responsibility and, in many cases, a balance must be struck between who is handling this liberty; this balance being between the healthcare team and the patient. This presentation will explore the ethical responsibility of the healthcare team to disclose all treatment options to patients.

KIRKHOF CENTER GRR 018

Daily Physical Activity and Video Game and TV Time on Body Mass Index in Youth: National Youth Fitness Survey

Participants attending 1:00 PM - 2:00 PM
Presenter: Meghan Imhoff
Mentor: Nicholas Lerma

Purpose: This study examined the relationship between TV and video game (VG) time with accelerometerderived physical activity (PA) on body mass index (BMI). Methods: Data was analyzed from 947 participants aged 6-15 from the 2012 National Youth Fitness Survey (NYFS). An Actigraph GT3X+ PA monitor was worn on the participant's left wrist for seven days. Daily averages for monitor-independent movement summaries (MIMS/day) were calculated and split into quartiles for two age groups (<10 years and 10+ years). Questionnaire data for TV and VG time were split into 4 categories each. Age and sexspecific z-scores for BMI were used. Multivariate regression for BMI z-scores by TV, VG, and PA were performed for both groups. Results: There was not a significant relationship between TV and VG time on BMI z-scores in children under 10 years. In those 10+ years, there was a significant interaction between VG and TV time, with 2 hours of both TV and VG time resulting in a decreased BMI z-score compared to those with less than one hour of each. Conclusion: There is a distinct relationship between TV and VG time on BMI z-scores in children and adolescents. This relationship is greater with less accumulated daily PA

KIRKHOF CENTER GRR 019

Polishing the Profession: Advances in Dentistry During the French Enlightenment

Participants attending 9:00 AM - 10:00 AM
Presenter: Marta Grabowski
Mentor: David Eick

Dentistry is a relatively new profession. For centuries, dental care providers were barbers rather than surgeons or doctors, and dental care was even a public spectacle! As dental procedures became more complex, specialists emerged. A milestone in the history of dentistry was the 1728 publication in France of The Surgeon Dentist (Le Chirurgien Dentiste) by Pierre Fauchard. This project will examine Fauchard's contributions to dentistry, attitudes towards dentistry in the Enlightenment, and developments in dental technology in that time. Today, dentistry has a reputation for expertise in particular procedures and care. As a future matriculant to dental school, I will reflect on my personal experience with the dental profession and consider how Enlightenment dentistry attitudes and practices have influenced modern dentistry.

KIRKHOF CENTER GRR 020

Investigating the Effects of Light and Temperature on Light Regulating BTB (LRB) Proteins in Arabidopsis thaliana

Participants attending 1:00 PM - 2:00 PM, 2:00 PM - 3:00 PM
Presenter: Samantha LaMantia
Mentor: Matthew Christians

Light is crucial for photosynthetic purposes, and for plant growth and development. Although photoreceptors for various wavelengths of light are known in plants, many questions remain about their regulation. Previous research found that the LRB E3 ligase proteins interact with both the cryptochrome (cry, blue light) and phytochrome (phy, red light) receptors and ubiquitinate them. Temperature seems to affect the stability of the LRBs in white light. Since phyB is suspected in modulating temperature responses in plants, we will investigate the connection between light signaling and temperature stabilization of the LRBs. This will be investigated through assessing LRB stability in different light wavelengths and temperatures. Understanding how plants respond to temperature variations in different light conditions will be extremely beneficial for agricultural applications, given climate change is affecting the quality and quantity of our crop land today.

KIRKHOF CENTER GRR 021

Chronic Obstructive Pulmonary Disease

Participants attending 11:00 AM - 12:00 PM
Presenter: Mckenna King
Mentor: John Capodilupo

This research examines chronic obstructive pulmonary disease for my senior capstone project. Throughout this comprehensive research, I will be examining the normal anatomy of each organ in the respiratory system and the pathophysiology of bronchi and alveoli in how these organs are affected in chronic obstructive pulmonary disease. There will be an outline of how chronic obstructive pulmonary disease is composed of two conditions: chronic bronchitis and emphysema. Additionally, there will be explanations on the history of the disease, showing the evolution of knowledge regarding the disease and diagnosis. One of the main aspects of the research is the treatments surrounding chronic obstructive pulmonary disease: past, present, and new treatments.

KIRKHOF CENTER GRR 022

HIV and AIDS: Past, Present, and Future Approach to Treatment and Understanding

Participants attending 11:00 AM - 12:00 PM
Presenter: Alexandra Tenney
Mentor: John Capodilupo

From the start of the first HIV viral infections, AIDS has swept through the world killing millions of people. While scientists work to uncover a cure, this new virus brings panic and a stigma to its patients and harms the families of

those who are affected. This capstone project is a comprehensive review of the HIV and AIDs virus and epidemic. The history of the virus is investigated as well as a discussion how HIV renders the human immune system inoperable. The molecular biological structure of HIV is uncovered for a better understanding of how it interacts with the human immune system. Past, present, and future approaches to treatment and prevention are highlighted to show how science is providing hope for HIV-positive people.

KIRKHOF CENTER GRR 023

Multimodal Classification of Single-cell Transcriptional State with Deep Neural Networks

Participants attending 11:00 AM - 12:00 PM
Presenter: Hemalatha Sabbineni
Mentor: Zachary DeBruine

Automatic curation and annotation of clinical samples is a growing challenge in modern healthcare. One increasingly popular clinical assay is single-cell sequencing, a technology that measures the expression of all genes in individual cells from a patient tissue sample or blood draw. We are developing AI software that can annotate information about new single-cell sequencing samples including cell type, tissue, and development stage. Our primary objective is to construct a deep neural network using the Keras machine learning library in R and train it on data from the Human Cell Atlas CellxGene repository. We have successfully classified cell types on a large subset of this dataset using GVSU's High-Performance Computing (HPC) cluster, employing hyperparameter tuning to optimize accuracy. Our short-term goal is to train the model on over 28 million single-cell transcriptomes, which will uncover comprehensive insights into the underlying complexity of clinical samples. To do this, we are incorporating a multichannel output architecture to simultaneously classify multiple output modalities in parallel from a single shared neural network. This research aids understanding etiology of complex human diseases and personalizes medical care, and it is a step towards personalizing rare disease treatment by predicting patient tissue differences from healthy donors.

KIRKHOF CENTER GRR 024

Book Bans and Diversity in Stories

Participants attending 12:00 PM - 1:00 PM
Presenter: Miranda Willer
Mentor: Sarah Joseph

This art piece in the form of collage aims to make the viewer more aware of the groups most negatively affected by the recent rise of book bans. It uses clippings from the covers of the most frequently challenged books of the past decade to reflect the potentially clandestine nature of seeking out banned materials. Most of the books that are frequently challenged tell stories of people of color, members of the LGBTQ+ community, and human sexuality in the context of coming-of-age narratives. Many of these books tell the stories of various minority groups; when these books are frequently challenged and often banned, it limits access and understanding of those experiences. Reading stories from different perspectives can broaden one's understanding and sense of empathy, which makes for better communication and relationships with others. This piece directly makes the statement that "Every Story Deserves the Opportunity to be Told," and aims to promote diversity in reading material.

KIRKHOF CENTER GRR 025

How Improper Specimen Collection Effects Turnaround Time

Participants attending 1:00 PM - 2:00 PM, 2:00 PM - 3:00 PM
Presenters: Briana Doll, Jordan Harris, Alexandra Montie, Emily Voss
Mentor: Dana Vaughan

In the laboratory, it is crucial for patient specimens to be collected properly to ensure efficient testing. When preanalytical errors occur, it delays the reporting of results that could be vital for patient care. It is important to educate those who have a role in the preanalytical process on how to correctly collect and handle patient samples. Lack of proper training may lead to the rejection of specimens and require recollection. Additionally, test results may be invalid due to poor collection techniques. This can lead to unnecessary or incorrect treatment for the patient. To further investigate this issue, databases such as PubMed, CINAHL, EBSCOHOST, and Google Scholar were used to find peer reviewed articles on this topic. Keywords such as "improper specimen collection" and "increased turnaround time" were used to narrow down the selection of relevant literature. Research on improper specimen collection across multiple departments in the laboratory revealed an increased turnaround time and a delay in reportable results, greatly affecting patient outcomes.

KIRKHOF CENTER GRR 026

ERK1/2 Inhibition in Type 2 Diabetic Mice

Participants attending 11:00 AM - 12:00 PM
Presenter: Joseph Coble
Mentor: Ruijie Liu

In diabetic conditions, the heart utilizes fatty acids as the main energy source due to impaired glucose usage. This reduced fuel flexibility leads to increased accumulation of lipid metabolites, myocyte death, and ultimate cardiac dysfunction. Our lab previously demonstrated that administration of U0126 to inhibit ERK1/2 in type 2 diabetic mice (db/db mice) significantly reduced the expression of hypertrophy genes in the heart. However, it is unknown whether U0126 could also attenuate the expression of fatty acid metabolism genes in the heart. The goal of this study was to use real-time PCR analysis to compare the expression of key fatty acid metabolism genes between the control, diabetic, and U0126-treated mouse hearts. We found that in db/db diabetic mouse hearts, the expression levels of PPARα, PPARγ, CPT1, and FACS genes were significantly increased. Pharmacological inhibition of ERK1/2 by U0126 significantly attenuated the cardiac expression of these genes. Similarly, the expression of Col3a1 gene, which codes for a collagen protein, was also reduced compared to the diabetic group. Our data suggest that increased fatty acid metabolism in the diabetic heart impairs the cardiac function; therapeutic targeting of ERK1/2 could be an approach to reduce the fatty acid metabolism and subsequent cardiac remodeling.

KIRKHOF CENTER GRR 027

Modeling Single-cell Perturbations through Fine-tuned Variational Autoencoding

Participants attending 1:00 PM - 2:00 PM
Presenters: Jagger Denhof, John Howland

Mentor: Zachary DeBruine

Single-cell sequencing is a genomics technology that measures the expression of genes in individual cells. A current challenge in molecular biology is understanding how perturbations to healthy cells can cause disease cell states. In this study, we are training an Artificial Intelligence (AI) model, a Variational Autoencoder (VAE), to predict perturbed disease gene expression states from healthy states. First, we pretrain a VAE to model healthy cells, reconstructing these human cells such that they appear nearly indistinguishable from real world cells. Second, we fine-tune our model by updating the weights or by adding a layer to the latent space of the pretrained model to teach the model to generate perturbed human cell outputs from healthy cell inputs. Finally, we will use the knowledge gained to extend to a human-mouse multimodal model that can generate perturbed cells across species, for instance, to train on a mouse model of human disease that enables generation of equivalent diseased human cells. The models we are developing can be used to simulate rare clinical disease and make predictions about cell gene expression states in disease that might never be systematically measurable in human populations due to their uniqueness and rarity.

KIRKHOF CENTER GRR 028

The IndieTrainer System: Using computerized text analysis to explore possible relationships between parental perceptions and children's phase of PWC skills learning

Participants attending 2:00 PM - 3:00 PM
Presenter: Dominik Vanderest
Mentors: Naomi Aldrich, Lisa Kenyon

Objective: The IndieTrainer system, consisting of a mobility device and gamified training modules, was created to support powered wheelchair (PWC) skills acquisition in children with cerebral palsy (CP). The purpose of this study was to investigate possible relationships between parental perceptions and their children's phase of PWC skills learning.

Method: This single-arm clinical trial involved six, 60-minute PWC training intervention sessions over three weeks with a single follow up session four weeks after the completion of the intervention. Twentyfive child-parent/caregiver dyads participated in the study. Children were 3 to 21 years of age and had a diagnosis of CP or other similar conditions. The Assessment of Learned Powered mobility use was administered at T0 (baseline), T1 (immediately post-intervention), and T2 (four-week follow up session) to determine children's phase of PWC skills learning. Semi-structured, audio-recorded parental interviews were conducted at T0 and T1. Interviews were transcribed and analyzed using the Linguistic Inquiry and Word Count program (LIWC), a computerized text analysis program.

Impact: Understanding the possible relationships between parental perceptions and their children's phase of PWC skills learning may provide insights into PWC skills training interventions and outcomes.

KIRKHOF CENTER GRR 029

Value-Compressed Sparse Column (VCSC): Sparse Matrix Storage for Redundant Data

Participants attending 10:00 AM - 11:00 AM, 11:00 AM - 12:00 PM
Presenters: Skyler Ruiter, Seth Wolfgang
Mentors: Erin Carrier, Zachary DeBruine

The amount of data generated by modern genomics technologies in recent years has increased exponentially. This creates challenges for both efficient storage and computation using this data. Singlecell sequencing is a genomics technology that measures the counts of genes expressed in individual cells resulting in a highly redundant and sparse dataset. Sparse data, containing mostly zeros, is often stored in the widely used Compressed Sparse Column (CSC) format. However, CSC fails to capitalize on the redundancy of values frequently found in single-cell matrices. This results in significantly larger data sizes, posing limitations for machine learning applications such as matrix factorization. We present two novel extensions to CSC that compress redundant data while preservin high-performance read access, enabling deep compression and fast computation. The first new format, Value-Compressed Sparse Column (VCSC), extends CSC by also compressing values based on redundancy. Our second extension, Index-and Value-Compressed Sparse Column (IVCSC), improves over VCSC by compressing indices. In machine learning applications, these formats show little performance loss while using significantly less memory. In conclusion, our two novel extensions to CSC significantly improve compression of redundant sparse data without reducing performance.

KIRKHOF CENTER GRR 030

Stream Team Field Guide

Participants attending 9:00 AM - 10:00 AM, 10:00 AM - 11:00 AM
Presenter: Jenna Kroft
Mentor: Amanda Buday

This project focuses on two National FFA Organization high school classrooms as students learn to generate community stream monitoring data that will serve as the starting point for identifying trends and critically impacted aquatic habitats around which future restoration projects or other interventions can be designed. These stream monitoring "teams" are unique because they focus on farming communities and their watersheds as water is critical to agricultural production.

The project involves the development of a comprehensive water-quality testing field guide to empower local high school students from Ravenna and Coopersville who are actively engaged in monitoring and assessing the health of their local stream systems. This "Stream Team Field Guide" informs students about the different water quality indicators and serves as a road map for collecting, understanding, and reporting stream monitoring data.

The field guide includes step-by-step instructions for the process of measuring water chemistry, observing the physical characteristics of monitoring sites, collecting macroinvertebrates, and analyzing water samples for E. coli bacteria.

KIRKHOF CENTER GRR 031

Cell Type Mixture Deconvolution for Single-cell Data with Deep Neural Networks

Participants attending 9:00 AM - 10:00 AM
Presenter: Zsolt Palmer
Mentor: Zachary DeBruine

Single-cell RNA sequencing is a genomics technology that measures the expression of genes in individual cells. In addition to single-cell sequencing, there are many methods that measure gene expression in small populations of cells, such as many spatially-resolved methods, or even in large bulk populations of cells. While bulk-sequencing methods are attractive for their cost effectiveness and sequencing depth, it is rarely possible to achieve the same level of granular biological insight into cell types within the sample. We are training a neural network to estimate the cell type composition of bulk expression data. To do this, we leverage large single-cell sequencing datasets such as the Human Cell Atlas CellCensus, train neural networks to classify cell types from single-cell sequencing data, and then simulate synthetic mixtures of single-cells while training our network to deconvolute these increasingly complex cell type mixtures. Our approach reveals robust performance in recognizing cell types from gene expression in a variety of modes, demonstrating the ability to discern subtle variations within complex datasets. This work lays the foundation for deconvolution of still more complex information from bulk sequencing assays.

KIRKHOF CENTER GRR 032

Associations About People in Young Children: A Distractability Analysis

Participants attending 12:00 PM - 1:00 PM, 1:00 PM - 2:00 PM
Presenters: Julia Belinsky, Daniel Freeland, Melanie Hernandez
Mentor: Josita Maouene-Cavin

The objective of this study was to elicit associations from children ages 3.5-6 years old to words of people (e.g., babysitter, grandpa, with some distracts such as pet or bicycle). However, previous SSD pilot studies had mixed results because of the range of distractibility among children. To reduce distraction, we tried a new method that required the children to put on colorful glasses with patches. The children were instructed to “Close your eyes, go into your mind, and think about a [word], what do you think?” for a total of 21 questions. Analyses revealed a significant correlation between the MLU (Mean Language Utterance or word count) and the distractibility level as per experimenters' judgments. We noticed an outlier who had the highest score in distractibility (between 4 and 5 on a Likert scale from 1 to 5), and an average of 10 words per response. One group had an average of 5 words per response for mid-level distractibility and another group an average of 2 words per prompt for low-level distractibility. We then created the associative network of these two groups of children and the outlier. We present the connectivity profile within and between all three networks.

KIRKHOF CENTER GRR 033

Investigation of Silyl Anions

Participants attending 12:00 PM - 1:00 PM, 1:00 PM - 2:00 PM
Presenter: Keegan Kalisek
Mentor: Randy Winchester

We studied the reactions and structures of silicon anions in order to discover new reactions and better understanding of these novel compounds. Specifically, we studied the addition of tris(trimethylsilyl)silyl anion to 9-bromomethylenefluorene and 9-chloromethylenefluorene which yielded the substitution product, 9-tris(trimethylsilyl)silylmethylenefluorene. We report the results of single crystal X-ray diffraction on 1 as well as comparisons of it with the analogous triphenylmethyl derivative, 2. The reaction of methyllithium or potassium tert-butoxide with 1 to form the silanide 3, which is capable of resonance stabilization, has been studied. We will be presenting the results of the reactions to form the anion as well as our studies of its reactions.

KIRKHOF CENTER GRR 034

Improving Blood Administration Documentation Across Clinical Units

Participants attending 9:00 AM - 10:00 AM
Presenter: Megan Urbanick
Mentor: Elizabeth Davis

Background: Increased and accurate documentation among nurses has become a challenge among many healthcare organizations. Barriers to complete documentation include but are not limited to limited staffing units, increase in novice nurses, and unfamiliarity with unit policies. Currently, within a clinical setting two units are facing challenges meeting the organizational goal of 70% compliance with blood administration documentation. Aims/purpose: The purpose of this quality improvement project was to increase documentation rates for blood administration in both the ICU and ER departments, aiming to meet the 70% compliance rate within the organization. Methods: Using the Lewin’s Change Theory model, staff nurses were educated on the blood administration policy along with proper documentation. Badge buddies were designed and provided to serve as an easy access tool at the bedside. Education at staff meetings and in person learning took place among both units. To have success of the project, reinforcing the change that was implemented will take place over the next year. Results/Conclusion: Ongoing monitoring and chart auditing will occur over the following year by unit leaders. Education and understanding of the blood administration policy along with proper charting will be assessed to determine project progression, pre- and post-implementation. Participants attending 12:00 PM - 1:00 PM, 1:00 PM - 2:00 PM Presenters: Julia Belinsky, Daniel Freeland, Melanie Hernandez

KIRKHOF CENTER GRR 035

Effects of Resilience on Social Exclusion

Participants attending 10:00 AM - 11:00 AM, 11:00 AM - 12:00 PM, 3:00 PM - 4:00 PM
Presenters: Katlyn Griessel, Kathryn Karmanos
Mentor: Christine Smith

According to William’s Temporal Need-Threat Model, ostracism threatens belongingness needs, the need for self-esteem, a meaningful existence, and the need for control. Once these needs are threatened, the excluded individual often strives to restore a sense of belonging by engaging in behaviors known to increase social acceptance. In this study, we predicted that a social exclusion vignette would threaten the above-mentioned needs more when the sources of exclusion were good friends as compared to new acquaintances. We also predicted that the dispositional characteristic of resilience would have a protective effect against need threat. More specifically, we

predicted an interactive effect between the source of exclusion (friends/acquaintances) and the resilience of the participant (high/low). That is, those higher in resilience would react significantly less negatively to being ostracized by new acquaintances than would those low in resilience whereas both groups would respond equally negatively to being excluded by close friends. This overall pattern will be assessed on a variety of dependent variables including the attributions made for the exclusion event. Data collection is currently underway.

KIRKHOF CENTER GRR 036

Salmonella enterica serovar Typhimurium Mutations and Biofilm Formation Under Various Environmental Conditions

Participants attending 10:00 AM - 11:00 AM, 11:00 AM - 12:00 PM, 12:00 PM - 1:00 PM
Presenters: Chelsea Aiken, Olivia Camara, Kiya Hammond
Mentor: Aaron Baxter

Salmonella enterica serovar Typhimurium is an extremely common food borne pathogen that can infect and/or maintained within a variety of animal hosts. As a pathogen it employs an array of genes to sense and respond to various environmental signals that allow it to effectively invade and colonize the intestines or cause systemic disease. As a pathogen, this requires significant gene regulation to control motility, adherence, biofilm formation, invasion, and macrophage survival with a multitude of genes responding to different environmental signals. Many of the genes for these functions congregate in chromosome regions called pathogenicity islands. Past studies discovered a 40 kb region of the genome that has all the characteristics of a pathogenicity island yet has never been described to whether it has a role in Salmonella virulence. To study this region a series of polar mutations were created to compare various processes to wild type bacteria. In this work, biofilm assays were performed under various environmental conditions to simulate different environments the bacteria encounter within a host. The focus was specifically on evaluating the impact of each mutation and its role on biofilm formation in different environments.

KIRKHOF CENTER GRR 037

A Geological Beach Dance: Sieving and Shaking Reveals Processes at Work in Florida's Coastal Sands

Participants attending 2:00 PM - 3:00 PM, 3:00 PM - 4:00 PM
Presenter: Kacey Frazier
Mentor: Peter Riemersma

Florida is home to a vast number of beaches, visited by millions of tourists every year. Beachgoers may notice differences in the appearance of sand as they travel and explore an individual beach from shore to ocean surf. My objective is to quantitatively describe and explain this variance in sand texture across Florida's coastal regions and to provide a geological perspective on beach processes. Samples were collected from 15 beaches located along Florida's Gulf and Atlantic Coasts. At each beach, samples were collected from the active surf zone, the swash zone, and the coastal dune. Samples were then dry sieved for grain size analysis into 17 different size fractions. For this project, I'm comparing my results of the active surf zone to results of the swash zone and coastal dune, which were done by previous GVSU students. My preliminary results highlight the impact that different processes and transport energy have on sediment texture. Sediment from the higher energy surf zone had a larger mean grain size and was more poorly sorted (larger standard deviation) compared to beach sediment from the nearby swash zone. Dune sand was even better sorted and finer grained, evidence of wind transport processes.

KIRKHOF CENTER GRR 038

Use of Propidium Monoazide Quantitative Polymerase Chain Reaction (PMA-qPCR) to Characterize Environmental Escherichia coli (E. coli)

Participants attending 11:00 AM - 12:00 PM
Presenter: Christopher Kotkowicz
Mentor: Kevin Strychar

Water quality monitoring for Escherichia coli (E. coli) in western Michigan beaches is frequently dependent on a genomic method called quantitative polymerase chain reaction (qPCR) where speed (3-5 hrs.) and specificity are important. However, as more sampling occurs in western Michigan, problems such as false positives and false negatives are occurring. These issues may be related to the inability to differentiate between viable (live) and non-viable (dead) cells. In this study, we used a newer and modified method called Propidium Monoazide Polymerase Chain Reaction (PMA-qPCR) which is a photo-reactive DNA binding method used to distinguish between live and dead cells. After optimization of PMA-qPCR with inlab cultures, evidence suggests that this method may be suitable for environmental samples to help determine the concentration of both live and dead cells, with potential to decrease the number of false positives.

KIRKHOF CENTER GRR 039

Status Seeking in Rock Climbing

Participants attending 4:00 PM - 5:00 PM
Presenter: Jacob Maring
Mentor: Robert Deaner

It has been frequently hypothesized that men are more likely than women to directly compete for status, yet there have been few direct tests of this claim. To address this, we are studying rock climbing, a sport where individuals seek status in ways that range from subtle to conspicuous. Our study's main prediction is that male climbers, relative to female climbers, will report more frequently engaging in climbingrelated behaviors that display or show off one's abilities or accomplishments; however, men are not predicted to report more frequently engaging other social behaviors. We will conduct pilot studies to identify behaviors that function, within the climbing community, to seek status, help others, or strengthen social relationships. In the main study, a large sample of climbers will report their frequency of engaging in the behaviors identified in the pilot studies. We will test for sex differences while controlling for climbing experience and demographic factors.

KIRKHOF CENTER GRR 040

Molecular Convergence in CAM and C4 Photosynthesis: A Study of Amino Acid Substitutions in Phosphoenolpyruvate Carboxylase Sequences

Participants attending 9:00 AM - 10:00 AM
Presenters: Lucinda Eberly, David Skidmore
Mentors: Timothy Evans, Agnieszka Szarecka

Phosphoenolpyruvate carboxylase (PEPC) is an enzyme responsible for carbon fixation in CAM and C4 photosynthesis, modified photosynthetic pathways that have arisen independently in numerous plant lineages. PEPC is present but non-photosynthetically active in C3 plants, making it an ideal candidate for studying the transition from C3 photosynthesis to CAM and C4 pathways. Consistent differences near active or allosteric sites in different C4 or CAM lineages could show how alternative photosynthetic pathways arise. We aligned 50 PEPC sequences representing CAM, C4, and C3 species and explored variation associated with each photosynthetic pathway. We calculated 32 conserved motifs using the MEME Suite, allowing us to determine conserved and variable segments across the PEPC sequence. We mapped these motifs onto the E. coli PEPC structure to assess the potential impact of their residues on protein function. Several candidate amino acid residues have been identified that show different distribution patterns in C3, C4, and CAM plants, suggesting different selection pressures in those photosynthetic pathways. We are focusing our current efforts on those residues associated with the active site or allosteric sites.

KIRKHOF CENTER GRR 041

Canadian Wildfires

Participants attending 9:00 AM - 10:00 AM
Presenter: Bryan Heiss
Mentor: Wanxiao Sun

Canada has been devastated by record-breaking series of wildfires since March 2023, with rising severity beginning in June 2023. Fires have raged in all 13 provinces and territories. The 2023 wildfire season burnt the most land in Canada's recorded history, exceeding the fire seasons of 1989, 1995, and 2014. With the acquired geospatial data and maps we can learn about what types of trees that have been destroyed in the Providence of Quebec, by evaluating the patterns and repercussions of previous wildfires, and the impacts of fires in 2023. Wildfires in Canada can significantly impact the landscape and their distribution. To understand this, various GIS and Remote Sensing methods are employed. For example, the Model Builder tool is used to automate the entire process. The Clip tool extracts specific regions of interest from larger datasets, while the Buffer tool creates buffer zones around fire-affected areas. Spatial interpolation estimates the distribution and density of specific tree types within identified fire perimeters. The 3D Analyst tool visualizes terrain and elevation data in three dimensions, enhancing understanding of topography, vegetation cover, and fire behavior. These methods provide an assessment of the extent of tree destruction caused by wildfires in Canada.

KIRKHOF CENTER GRR 042

Synthesis of Diphenylurea Antibiotics with a Novel Amine Substitution

Participants attending 12:00 PM - 1:00 PM, 1:00 PM - 2:00 PM
Presenters: Emily Agustin-Mazariegos, Chloe Alverson, Grace Connelly, Sophie Wildemann
Mentor: Matthew Hart

Many people suffer from tuberculosis, with limited and exhaustive treatments available. Increased antibiotic resistance makes continued treatment difficult. The goal of this project is to find new ways to treat TB. Specifically, the effects of attaching a dimethylamino ethyl amide at the -meta or -para positions on the diphenyl urea will be examined. Additionally, different changing chain lengths will be examined. To test this, the dimethylamino propyl amide group will be prepared to test whether the -meta or -para positions on Ring B exhibit different antimicrobial properties than the two carbon dimethylamino ethyl amide group. The proposed synthesis for creating the target ureas is as follows: a nucleophilic acyl substitution reaction between acid chloride and either the dimethylethyl-amine amide or the dimethylpropyl-amino amide, giving the nitrobenzamide derivative. The nitro group will be reduced using catalytic hydrogenation to produce the aniline derivative, which is then reacted with an isocyanate. To confirm molecular identities, spectral data such as 1H-NMR, 13C-NMR, IR spectroscopy and GC-MS will be completed. Conclusions and results will be reported. Antimicrobial activity will be assessed to test whether the molecule should be a continued source of research to treat tuberculosis.

KIRKHOF CENTER GRR 043

Encouraging Realism and Mitigating Bias in Multimodal AI with Adversarial Feedback

Participants attending 9:00 AM - 10:00 AM
Presenters: Jack Lukomski, Dat Nguyen, Cardell Taylor, Linhao Yuan
Mentor: Zachary DeBruine

Adversarial feedback is a training technique used in generative AI that increases the realism of generated samples. In adversarial AI networks, there are two models that are trained alternately: a discriminator and generator. During training, the generator learns to create outputs perceived as real by the discriminator, which in turn learns to diffe entiate between real and generated samples. Adversarial feedback has many applications, including reducing bias in multimodal networks. We are incorporating adversarial feedback into an autoencoder neural network, which is trained to reconstruct input data. Our autoencoder accepts inputs from multiple 'expert' networks. We enhance it with adversarial discriminators at each encoder layer, driving it to generate unbiased data. By using discriminators at the end of the network, we can train the autoencoder to generate realistic data. We devised metrics to compare the training effectiveness of our discriminators against a 'meta-discriminator' from a cold start. In ongoing work, we will measure whether the model is less biased towards one modality than a network trained without discriminators. This works shows that adversarial feedback can be used to reduce bias in multimodal generative AI models and promote generation of realistic data.

KIRKHOF CENTER GRR 044

Architecting Generative AI for Cross-Generation Across Modalities

Participants attending 9:00 AM - 10:00 AM
Presenters: Parker Bernreuter, Anthony Boos, Hamin Hong, Jaiden Ortiz, Kyle Scott
Mentor: Zachary DeBruine

Multimodal Artificial Intelligence (AI) learns relationships between highly disparate domains of knowledge,

and can cross-generate between these domains, for instance generating video from a text prompt. The multimodal Mixture-of-Experts (MoE) Variational Autoencoder (VAE) is an AI architecture that can both reconstruct data from any single modality and cross-generate between modalities. This project aims to implement a MoE-VAE to achieve cross-species understanding of human molecular biology. Our MoE-VAE is trained on single-cell gene expression data, which is a matrix of gene expression in single cells. By training on both human and mouse data, our MoE-VAE can cross-generate equivalent human data from mouse inputs, and vice versa. We are tuning hyperparameters in our model to optimize performance. We are also exploring advanced machine learning architectures such as residual connections and multiheaded networks within our model to achieve a boost in performance. This model will advance biomedical research and personalized medicine by enabling us to transfer our experimental knowledge from model organisms, including mouse models of disease, to humans.

KIRKHOF CENTER GRR 045

Characterizing the Role of Mannitol and Other Sugars in the Aggregation Process of the Functional Amyloid Kassinin

Participants attending 11:00 AM - 12:00 PM
Presenter: Lillie Waldron
Mentor: Laura Hawk

Protein aggregation, or the clumping together of proteins, to form amyloids is implicated in several diseases such as Alzheimer's Disease and Parkinson's Disease. This aggregation has several stages, progressing from isolated protein molecules (monomers) to small aggregates (oligomers), which are toxic to cells, and finally to large, string-like mature aggregates. Despite this association with disease, functional amyloids, which have normal biological functions, also result from protein aggregation. Kassinin, an amphibian peptide involved in nerve signal transmission, is a model system for functional amyloid study. To compare the aggregation of functional and disease-causing amyloids, we monitored the aggregation process of fluorine-labeled kassinin. Previous work indicated mannitol, a sugar molecule, affected the aggregation process of kassinin. To further characterize the role of mannitol and other sugars in kassinin's aggregation, we monitored the aggregation process of fluorine-labeled kassinin in the presence of mannitol and other sugar molecules. We synthesized the fluorine-labeled kassinin through solid-phase peptide synthesis and purified the peptide by high performance liquid chromatography (HPLC). The aggregation of kassinin with various sugars was monitored by 19F-NMR. Examining the aggregation process of functional amyloids and contrasting with disease-associated amyloids will contribute to a clearer understanding of the disease process of protein aggregationassociated diseases.

KIRKHOF CENTER GRR 046

Analyzing the Fatty Acid Metabolism Gene Expression in Diabetic Mouse Hearts

Participants attending 10:00 AM - 11:00 AM
Presenter: Annabel Maag
Mentor: Ruijie Liu

In diabetic conditions, the heart shifts to fatty acids as the primary energy source due to impaired glucose usage. This reduced fuel flexibility leads to increased intramyocardial accumulation of lipid metabolites, myocyte death, and ultimate cardiac dysfunction. Our lab had previously demonstrated that administration of U0126 in streptozotocin (STZ)-induced diabetic mice significantly reduced the expression of hypertrophy genes in the heart. However, it is unknown whether U0126 could attenuate the expression of fatty acid metabolism genes in the heart. The goal of this study was to use real-time PCR analysis to compare the expression of key fatty acid metabolism genes between control, diabetic and U0126-treated mouse hearts. We found that in diabetic mouse hearts, the expression levels of PPARα, PPARγ, CPT1, and FACS genes increased significantly. Pharmacological inhibition of ERK1/2 by U0126 significantly attenuated the cardiac expression of these genes. Similarly, the expression of Col3a1 gene, which codes for a collagen protein, was also reduced compared to the diabetic group. Together, our data suggest that increased fatty acid metabolism in the diabetic heart impairs the cardiac function, and therapeutic targeting of ERK1/2 could be an approach to reduce the fatty acid metabolism and subsequent cardiac remodeling.

KIRKHOF CENTER GRR 047

Post-Mortem Examination of Esophageal Cancer Metastasis in Adult Patient

Participants attending 10:00 AM - 11:00 AM
Presenter: Ronald Madrid
Mentors: Natalie Laudicina, Dawn Richiert, Laura Stroik, Cynthia Thompson

Esophageal cancer is the sixth most common cancer in the United States population and, although its specific cause is unknown, it is associated with gastrointestinal reflux disease, heavy alcohol use and smoking. The five-year survival rate for esophageal cancer patients is approximately 10%. During dissection of an adult male cadaver aged 64, who died of esophageal cancer, two hollow spheroid tumors were found in the right erector spinae and left deltoid muscles. These tumors are hypothesized to be metastasized cancers from the esophagus. The hollow morphology of the tumors may be due to the cells' rapid growth such that they balloon out with no tissue filling in the space as the cells grow outward. This morphology is often associated with cancer stem-like cells such as squamous cell carcinomas and adenocarcinomas, the most common forms of esophageal cancer. Stem-like cell cancers are especially difficult to treat as they possess intense drug resistance, resulting in the poor prognosis of esophageal cancer patients. Here we discuss the implications of this clinical manifestation of esophageal cancer and its metastasis.

KIRKHOF CENTER GRR 048

Type I Diabetes: The Past, Present, and Future Approaches to its Understanding and Treatment

Participants attending 2:00 PM - 3:00 PM
Presenter: Gabriella Vaz Trevisan
Mentor: John Capodilupo

The goal of this capstone project is to present a comprehensive overview of the ongoing epidemic of diabetes, including past, present, and future approaches to understanding and treating type 1 diabetes (T1D) and type 2 diabetes (T2D)- both prediabetes and gestational diabetes.

KIRKHOF CENTER GRR 049

Communication and Identity: A Study of Midwestern LGBTQIA+ College Student Experiences Navigating Spaces and Performing Identity

Participants attending 9:00 AM - 10:00 AM, 10:00 AM - 11:00 AM
Presenter: Bryce Thomas
Mentor: Anthony Spencer

This study explores both the performance and navigation of identity among LGBTQIA+ college students at a university in the Midwest. I adopt an interpretivist approach with critical overtones to explore the nuances of intercultural and intersectional aspects of identity within these experiences. Through qualitative research methods, specifically in-depth interviews, I seek to uncover how LGBTQIA+ college students at a Midwestern university perform their identity on campus. Drawing on the theoretical frameworks of queer theory and sensemaking, my analysis identifies and interprets significant themes emerging from the narratives of participants, aiming to offer a comprehensive understanding of how these students articulate, define, and perform their identities in on-campus spaces. By focusing on the lived experiences of LGBTQIA+ college students at a university in the Midwest, this study contributes to the broader discourse of identity performance and navigation in higher education. These findings are expected to not only enrich the academic conversation surrounding LGBTQIA+ identities and campus climate, but also offer insights into the layers of meaning that LGBTQIA+ college students attach to their identity, how they navigate their expressions of identity within the campus environment, and what impacts or influences their experiences of identity performance on campus.

KIRKHOF CENTER GRR 050

Synthesis of Diphenyl Ureas Antibiotics with Trifluromethyl and tert-Butyl Substitutions

Participants attending 12:00 PM - 1:00 PM
Presenters: Rachel Duford, Hannah Hackett, Owen Smythe, Parker Van Ess
Mentor: Matthew Hart

It is estimated that roughly 1.3 million people died from TB in 2022, based on data from the WHO this would make TB the 13th leading cause of death. Along with the already high mortality, some strains have become resistant to the drugs used to combat the disease. In this project, new variations of a drug will be synthesized to determine if any have a greater chance of effectively fighting TB. In our experiment, the addition of a trifluoromethyl group to the ortho, meta, and para positions will be prepared. Additionally, the addition of a p-tert-butyl group will be prepared to see how the difference in electronegativity and size will impact the activity. Aside from these differing groups, we will also look at the impact of adding an amide chain to the meta position. Our results will be confirmed using a mix of NMR, IR, and mass spectrometry. Once the new variations are prepared, we will examine their effectiveness in treating TB.

KIRKHOF CENTER GRR 051

Assay Validation for Heat Shock Protein (HSP) Measurement from Mammalian Feces

Participants attending 9:00 AM - 10:00 AM
Presenter: Sawyer Barton
Mentor: Cynthia Thompson

As climate change increases heat stress, heat shock protein (HSP) levels have been shown to track the degree of thermal stress experienced by wild animals. Despite the crucial role HSPs play in understanding how organisms respond to increasing thermal stress, current sampling methods are invasive, often requiring euthanasia or biopsies, which has limited research efforts. Our lab has been working to develop an alternative, noninvasive method to measure HSPs from mammalian feces. With previous success in the presence and detection of HSPs in a variety of mammal species, the ELISA tests require validation through spike recovery and parallelism. The results will allow us to assess the accuracy and reliability of fecal HSP measurement which is necessary to establish noninvasive methods that can feasibly be applied to future studies.

KIRKHOF CENTER GRR 052

Computational Studies Varying Metal Combinations in a Bimetallic Complex to Convert

Carbon Monoxide into Carbon Dioxide

Participants attending 10:00 AM - 11:00 AM
Presenter: Alyssa Hussey
Mentor: Richard Lord

The conversion of carbon monoxide into carbon dioxide is a process that can occur naturally but is actively being studied by chemists in a laboratory setting with nature's carbon monoxide dehydrogenase (CODH) as an inspiration. CODH works by exploiting a high oxidation state Mo(VI), whose oxo ligand acts as an oxidant, and a low oxidation state Cu(I) that binds carbon monoxide and facilitates the formation of carbon dioxide. Groysman and Lord recently reported the formation of a heterobimetallic complex with a xanthene-bridged heterodinucleating ligand containing both hard and soft chelates (Inorg. Chem. 2023, 62, 15063-15075). The combination in that man-made system of Mo(VI) and Mo(0)/Cr(0) did not produce carbon dioxide. In this work, the two metals within the bimetallic complex are replaced with similar group 6 metals and studied using computational chemistry to analyze the thermodynamics and reactivity. Comparisons to the original system and future directions with other metals will be presented.

KIRKHOF CENTER GRR 053

Comprehension of Belief Consistent and Inconsistent Information

Participants attending 9:00 AM - 10:00 AM
Presenters: Abby DeSantis, Rebecca Dewey, Julia Stuckey
Mentors: Todd Williams, Michael Wolfe

In the current study we examine whether an individual's beliefs influence their comprehension of information that is consistent or inconsistent with those beliefs. Past research contends that individuals are better able to comprehend material if it is consistent with their beliefs (Richter & Maier, 2017). This phenomenon is referred to as the text-belief consistency effect. The effect has been challenged by other findings that fail to replicate a belief consistency comprehension advantage. Consequently, we first aim to replicate previous research while eliminating confounds in the comprehension measure by choosing article topics that are evenly represented by our subjects across beliefs. We hypothesize that we will replicate previous findings. We view this study as the first in a series of studies exploring this phenomenon.

KIRKHOF CENTER GRR 054

Red Beetroot (Beta vulgaris rubra) and Vascular Reactivity in Porcine Coronary Arteries

Participants attending 9:00 AM - 10:00 AM
Presenters: Carter Bechtel, Matthew Engel, Kyle Fish, Grace Flanders, Daniel Nichols, Drew Smith
Mentor: Francis Sylvester

The primary purpose of this study was to determine the effect of red beetroot (Beta vulgaris rubra) on the vascular reactivity of coronary arteries. Initially, 1 gram of beet powder was diluted in 10 mL of KrebsHenseleit solution. Porcine coronary arteries were dissected, cut into approximately 5 mm rings, and mounted in isolated organ baths coupled to force transducers. Some of the coronary arteries were denuded prior to mounting in the organ baths; this was done to determine the potential role of the endothelium in mediating the observed vascular responses. Following a 1-hour equilibration period, the arterial rings were treated with increasing concentrations of potassium chloride (15-60 mM KCl), a potent vasoconstrictor, followed by increasing concentrations of acetylcholine (10-8-10-4 M ACh), an endothelium-dependent vasodilator, and sodium nitroprusside (10-8-10-4 M SNP), an endotheliumind pendent vasodilator. Coronary arteries were then treated with a single dose of U46619 (10-7 M U46619), a receptor-mediated vasoconstrictor. After preconstricting with U46619, the arterial rings were treated with increasing concentrations of beet powder solution (10-7-10-2 g/mL).

KIRKHOF CENTER GRR 055

Vertebrate Microfossil Screen Washing Investigation

Participants attending 12:00 PM - 1:00 PM, 2:00 PM - 3:00 PM
Presenters: Maxwell Bishop, Dylan Ruiter, Elise Voglewede
Mentor: Laura Stroik

The objective of the Vertebrate Microfossil Lab at Grand Valley State University is to discover new fossil specimens in sediment originating from a variety of localities within the Uinta Basin, Utah. The age of sediment recovered is middle Eocene (ca. 40 Ma), around the time of a large climatic event known as the Middle Eocene Climatic Optimum (MECO). Our goal is to better understand the environment before, during, and after the MECO so that we can understand how this extreme change in climatic conditions affected the region's vertebrate fauna.

In order to efficiently examine this sediment, we adopted a multistage process of excess sediment removal, which included dry sieving, wet sieving, and chemical washing. For this latter process, we performed several experiments to determine the effectiveness of different chemicals on breaking down sediment. Specifically, we tested H2O2, mineral spirits, vinegar, Alconox, Citrinox, and a combination of H2O2 and mineral spirits. The results indicated that a combination of H2O2 and mineral spirits was most effective in breaking down the sediment.

After processing, the remaining sediment is thoroughly picked through with a dissecting microscope to find fossil specimens. Over the course of this year's research, we found a total of 42 fossils.

KIRKHOF CENTER GRR 056

Investigation of Lake Superior Erosion Rates on the Coast of Michigan's Upper Peninsula

Participants attending 10:00 AM - 11:00 AM
Presenters: Michael Baldus, Dylan Ruiter
Mentor: Peter Wampler

The Great Lakes region is subject to many geomorphic changes, particularly along its coastline in the form of coastal erosion. Increased erosional rates have proven to be an ongoing issue for much of Michigan's coastal infrastructure, resulting in extensive damage and even the loss of homes. Compared to the other Great Lakes, Lake Superior exhibits much higher quantities of resistant bedrock exposures along its coastal regions. Our study used ArcGIS Pro to investigate several sites along the northern coastal region of Michigan's upper peninsula to discover how the differing geological conditions surrounding Lake Superior affect its coastal erosion rates in comparison to the other Great Lakes. This involved examining the historical extent of coastal regions to determine erosional rates of previous years. The results from this also allowed for the identification of areas that are at elevated risk of erosion. Further examination of geological attributes such as soil type, bedrock geology, wave exposure, and slope were utilized to identify factors that may lead to higher erosional rates along Lake Superior's shore. Our study will help establish a fundamental understanding of coastal erosion along Lake Superior that is essential for developing effective mitigation strategies to protect valuable coastal infrastructure and homes.

KIRKHOF CENTER GRR 057

Determining Ideal Laboratory Conditions for Epithemia Growth

Participants attending 12:00 PM - 1:00 PM
Presenters: Jade Dawson, Haarika Hebbur, Sofia Martinez Martinez, Parker Miller, Ryan Ruppert, Olivia Sandman, Brett Vincent
Mentors: Heidi Abresch, Sarah Hamsher

Diatoms are microscopic algae with silica cell walls. Epithemia, a genus of diatoms belonging to the Rhopalodiales, have cyanobacterial endosymbionts that allow them to fix atmospheric nitrogen and live in low nitrogen environments. Because of their nitrogen fixation, they are an integral part of the global nitrogen cycle in addition to the carbon cycle. To place these diatoms in evolutionary context using molecular data, they need to be cultivated in a laboratory. Collection of Epithemia from the environment indicates they prefer high light environments, but preliminary culturing attempts suggest they grow better in low light conditions. In addition, Epithemia have been cultured

in two different media in previous studies, WC-N and CSi-N. To determine the ideal conditions for laboratory growth of this strain of Epithemia, we cultured them in a full factorial design in low (6 µmol m-2 s-1) and high (40 µmol m-2 s1) light conditions and in WC-N and CSi-N media. Preliminary results suggest WC-N in high light conditions did not grow as well as other treatments, which displayed similar growth. Better understanding of the growth conditions for this strain will allow us to culture this genus more easily, and ultimately place it more accurately in evolutionary context.

KIRKHOF CENTER GRR 058

Do Mutations that Disrupt the Arylalkylamine N-Acetyltransferase Like 7 (AANATL-7) Gene in Drosophila melanogaster Affect Histamine-like /immunoreactivity in the Larval Central Nervous System?

Participants attending 12:00 PM - 1:00 PM
Presenters: Olivia Miller, Bushra Rashrash, Ashlyn Tyson
Mentor: Martin Burg

Histamine immunostaining of accessory glands in Drosophila males have indicated the presumed presence of histamine, as mutants defective in histamine synthesis had no signal detected using a “histamine” antibody. Further investigations have determined that the “histamine” antibody also detects two metabolites of histamine: carcinine and N-acetylhistamine (NAH). The enzyme, arylalkylamine Nacetyltransferase like 7 (AANATL-7) in Drosophila melanogaster catalyzes the acetylation of histamine in vitro, forming N-acetyl histamine (NAH). Recently, mutations were generated to disrupt the AANATL-7 gene, resulting in the elimination of “histamine-like immunoreactivity" (HLI) in the accessory gland, suggesting that the histamine antibody is detecting NAH in the accessory gland, rather than histamine. It is not known whether the AANATL-7 mutation disrupts or alters HLI in other tissues, such as that found in the central nervous system (CNS). We are therefore investigating whether the CNS “histamine” immunosignal is disrupted by mutations in the AANATL-7 gene, by examining the CNS from normal and AANATL-7 mutants using the “histamine” antibody. The effects of AANATL-7 disruption on “histamine” immunodetection in the central nervous system of D. melanogaster will then be determined using confocal microscopy.

KIRKHOF CENTER GRR 059

Ice Coverage Trends in the Great Lakes Region

Participants attending 1:00 PM - 2:00 PM
Presenters: Michael Baldus, Dylan Ruiter, Andrei Skelly
Mentor: Kin Ma

The Great Lakes region is an area commonly known to experience large fluctuations in its seasonal ice coverage. The percentage of ice coverage can vary drastically from year to year due to a multitude of climate-based phenomena such as polar vortexes and La Nina/El Nino. However, viewing these fluctuations on a larger time scale can be utilized to observe large-scale climatic trends, such as the impacts of global temperature increases. In our research, we allocated datasets of Great Lakes' percent ice coverage from 1973 to 2023 and using GIS software ArcMap 10.8.2, compiled the data into a series of 4 maps representing ice coverage data from the years 1973, 1993, 2013, and 2023. This selection of years was chosen to avoid misrepresenting the overall trend with anomalous years such as polar vortex years like 1983 and 2003. Further analyses were performed by comparing the results with temperature trends taken from the Muskegon County Airport Station in Norton Shores, which showcased an inverse relationship between the two datasets. The results indicate that gradual increases in global temperature have resulted in the subsequent gradual decrease in Great Lakes ice coverage over the past half a century.

KIRKHOF CENTER GRR 060

Stratigraphy, Petrography, and Carbon Isotope Variability Among Stromatolites During the 2.2 GA Lomagundi-Jatuli Event

Participants attending 9:00 AM - 10:00 AM, 10:00 AM - 11:00 AM, 11:00 AM - 12:00 PM
Presenter: Maya Giannecchini
Mentor: Dylan Wilmeth

Around 2.2 billion years ago, during the Lomagundi-Jatuli Event (LJE), marine carbonates record a significant positive carbon isotope excursion (δ13Ccarb), with values up to +10 to +15 ‰, far beyond the typical range of -5 to +5 ‰. The causes of this event are debated, and may be linked to the Great Oxidation Event around 2.4 billion years ago. Some suggest localalized evaporative basins led to δ13Ccarb enrichment, while others argue for global oceanic changes. This study examines the LJE hypotheses using new data from stromatolites in Michigan's Upper Peninsula. The Kona Dolomite, representing an evaporitic environment, exhibits δ13C enrichment (+5 to +10 ‰), and the Randville Dolomite, from an open shoreline, shows depletion (+0 to +3 ‰). Despite their geographic proximity they are often considered correlating deposits, but display distinct isotopic signatures. An overlooked aspect is the short-term δ13C changes during the LJE. Investigating finely-layered stromatolites, the study aims to discern if δ13C variations occurred over smaller time scales. Homogeneity in δ13C across layers suggests a global oceanic influence, while pronounced shifts may indicate localized environmental factors. This research could contribute to resolving the local versus global debate of the LJE.

KIRKHOF CENTER GRR 061

Freshwater Algae: A Flora of Common Genera in West Michigan and an Experiment Revealing Interactions Between Diatoms and Cyanobacteria

Participants attending 9:00 AM - 10:00 AM
Presenters: Davis Fray, Sofia Martinez Martinez, Ryan Ruppert
Mentor: Sarah Hamsher

Algae are a polyphyletic group of organisms that photosynthesize and live in environments with adequate light and water. While important to global carbon cycling, algae can be difficult to identify and interactions between them are not well-established. Thus, we developed two projects: 1) a field guide of common algae in the Western Michigan region in winter; and 2) a growth experiment to better understand interactions between Craticula cuspidata (Cr) and an Anagnostidinema (ANA1) strain. For the flora, we depicted the twenty genera most encountered by students in the GVSU Freshwater Algae class. For the growth experiment, ANA1 percent cover was analyzed from images taken over 30 days of ANA1 in coculture with Cr, in eukaryote-free treatment, and in a bacteria-limited treatment to

determine what was responsible for the increase in ANA1 growth. Ultimately, we illustrated commonly encountered algal genera in the Bacillariophyta, Chlorophyta, Charophyta, and Cyanobacteria; and found that ANA1 grew best with Cr cells but grew in the eukaryote-free and bacteria-limited conditions as well. This illustrated guide will allow for improved identification in classroom and presents a simple and effective method of understanding interactions between different algal divisions.

KIRKHOF CENTER GRR 062

Impact of Mentoring Programs on Older Adults

Participants attending 11:00 AM - 12:00 PM
Presenter: Kaitlin Hendrickson
Mentor: Jing Chen

Previous research has suggested that mentoring programs can help older adults become socially engaged, incentivize resilience, and improve their overall health and well-being (Au et al., 2015). This research project examines the impact of a one-on-one co-mentoring program on older adults. Older adults will be surveyed about their experiences of working with college students as a mentor. Specific perceived changes in their sense of purpose, community, and point of view will be explored through semistructured interviews. The patterns and themes reflected in the responses as well as suggestions for more effective intergenerational integration programs will be discussed. The implications of this project can help develop future projects and programs to help intergenerational communication and engagement become more of a normality. As the aging population is growing, it is a pivotal time to encourage intergenerational socialization and mentoring programs.

KIRKHOF CENTER GRR 063

Assessment of Undergraduate Peer-to-Peer Mentor Program Focused on Advising and Student Success: Mentees Satisfaction

Participants attending 2:00 PM - 3:00 PM
Presenters: Emma Fairchild, Megan Singer
Mentor: Tessa Jordan

Undergraduate peer-to-peer mentoring is an effective way to provide academic advising, to increase students' sense of belonging, and to increase retention rates and GPA (e.g., Collings et al., 2014; BordesEdgar et al., 2011; Fox et al., 2010; Jacobi, 1991; O'brien et al., 2012; Sanchez et al., 2006). To increase access to academic advising and promote student success, we developed an undergraduate student peerto-peer mentoring that is in its third year of operation. The program connects experienced, upper levelstudents with less experienced students. We've trained 28 peer mentors who have engaged in over 200 1:1 peer mentoring sessions. Quantitative and qualitative data will be shared. Results indicate that our peer mentoring program is successfully meeting the needs of mentees who are highly engaged and satisfied with our peer mentorship program.

KIRKHOF CENTER GRR 064

The Parental Perceptions of Adolescent Social Media Use and the Role they Play in Social Media Monitoring

Participants attending 4:00 PM - 5:00 PM
Presenters: Kathryn Karmanos, Grace LaDouceur
Mentors: Mihaela Friedlmeier, Courtney Kowalczyk

There is an increase in concern over the risks of adolescent excessive social media usage (SMU). Risks include an increase in depressive symptoms, fear of missing out, and cyberbullying. However, there are few studies on how parental perceptions of social media influence the way they monitor the SMU of their teens. Past research focuses on "direct" mediation and "active" meditation monitoring strategies. Direct mediation is characterized by the use of parental controls and privacy settings. The adolescent is given little autonomy. Active mediation is characterized by open discussion about healthy SMU between the parent and adolescent. The child is given more decision making power under this strategy. Studies have found better outcomes when parents use active mediation strategies compared to direct mediation in isolation. Additionally, modeling is a factor to consider. When parents engage in excessive SMU, children can vicariously learn similar behaviors even when active mediation strategies are being implemented in the home. Parents do not receive the sufficient education needed to be informed on each of these factors. Our study aims to identify effective monitoring strategies in order to develop effective interventions to educate parents on healthy MSU. The methodology of the study is currently underway.

KIRKHOF CENTER GRR 065

Assessment of Training Undergraduate Peer-to Peer Mentors Focused on Advising and Student Succes

Participants attending 1:00 PM - 2:00 PM
Presenters: Emma Fairchild, Megan Singer
Mentor: Tessa Jordan

Undergraduate peer-to-peer mentoring is an effective way to provide academic advising, increase students' sense of belonging, and increase retention rates and GPA (e.g., Collings et al., 2014; BordesEdgar et al., 2011; Fox et al., 2010; Jacobi, 1991; O'brien et al., 2012; Sanchez et al., 2006). To increase access to academic advising and promote student success, we developed an undergraduate student peerto-peer mentoring that is in its third year of operation. The program connects experienced, upper level-students with less experienced students. We've trained 28 peer mentors who have engaged in over 200 1:1 peer mentoring sessions. Quantitative and qualitative data will be shared. Results indicate that our peer-mentoring program has successfully trained undergraduate student peer mentors and that our peer mentors are highly satisfied with their participation in our program.

KIRKHOF CENTER GRR 066

More Than a Logging Town: Student Perspectives of Two-Eyed Seeing in Blendon Landing

Participants attending 11:00 AM - 12:00 PM

Presenters: Rose Chiodo, Margaret Jastifer, Michelle Oberlin
Mentors: Steven Dorland, Wesley Jackson

In this project, we reflect on student experiences of the GVSU archaeological field school conducted in the Spring Semester of 2023. In this field school, the major goal was to develop methods to decolonize archaeology at GVSU by centering Two-Eyed Seeing, an Indigenous approach that brings together Western science and Indigenous Knowledge. For this project, we primarily focus on our personal experiences, but draw from fellow classmates to assess their experiences in this field school. Our assessment focuses on the effectiveness of the instructors in teaching a Two-Eyed Seeing approach, the student reception of these teachings, and the overall student perceptions that this approach created throughout the field school. As part of this assessment, we highlight the importance of having local Indigenous community members speak to students about land-based learning and Indigenous Knowledge, which provided us with new perspectives to bring into our anthropological training. Overall, our analysis demonstrates that a Two-Eyed Seeing approach can be beneficial to student experience, but there are challenges that need to be addressed to ensure success.

KIRKHOF CENTER GRR 067

The Impact of Low Intensity Pedaling versus Non-Pedaling on Gaming Performance

Participants attending 9:00 AM - 10:00 AM
Presenter: Joshua Fernando
Mentor: Nicholas Lerma

Two out of three Americans play video games. Time spent playing video games primarily takes place while sitting which is a sedentary behavior. While existing literature has examined the health implications of interrupting sedentary behavior, a gap exists on its impact on gaming performance. Thirteen participants performed 60 minutes of first-person shooter training modules on two separate visits. During each visit they performed three rounds of eleven different training modules. During one of the visits participants performed two 3-minute self-pedaling sessions at a self-selected pace. Individual game scores, session averages, and percent differences were recorded. Paired t-tests will be used to analyze if differences exist in gaming performance when pedaling while playing.

KIRKHOF CENTER GRR 068

Comparing Exposure to Pollution in and within Detroit and New Orleans

Participants attending 9:00 AM - 10:00 AM, 10:00 AM - 11:00 AM, 11:00 AM - 12:00 PM, 3:00 PM - 4:00 PM, 4:00 PM - 5:00 PM
Presenter: Griffin Thompson
Mentor: Kin Ma

New Orleans, LA & Detroit, MI are two cities with central roles in America's industrial legacy – through the oil and auto sectors, respectively – but negative environmental consequences of pollution often impact the populations within these communities. Moreover, effects of pollution almost certainly disproportionately impact disadvantaged populations in the respective areas of study, particularly African American and low-income communities. This project will analyze the effects of pollution across these communities/populations, evaluating racial/economic/spatial factors that I hypothesize result in uneven exposure to environmental risks in the study area. This project will use ArcGIS Pro to further understand the exposure to pollution sources in these two cities and identify the populations most affected through geospatial and statistical analyses. Additionally, it will explore the racial and economic characteristics of Detroit & New Orleans in relation to pollution sources, comparing the demographics of census tracts containing pollution sources to those without. The data for this project is provided by the U.S. Census Bureau, the EPA, the States of Michigan and Louisiana, the USGS, and other open-source data. This project will utilize ArcGIS geoprocessing tools to examine sources of pollution and explore the level of environmental injustice, if any, in Detroit & New Orleans.

KIRKHOF CENTER GRR 069

Exploring the Relationship Between Proximity to Hazardous Waste Treatment, Storage and Disposal Facilities on Life Expectancy in Wayne County

Participants attending 9:00 AM - 10:00 AM, 12:00 PM - 1:00 PM
Presenter: Alexander Baetz
Mentor: Kin Ma

The focus of this research project is to analyze how proximity to hazardous waste treatment, storage and disposal facilities (TSD) impacts the population of Wayne County, Michigan. My goal is to investigate the relationship between proximity to TSD and below average life expectancy. We expect census tracts with closest proximity to TSD will have below average life expectancies, especially those with TSD sites within the census tract. I also expect minority populations and low-income populations to suffer the most severe consequences to life expectancy because of their proximity to TSD. Furthermore, I will assess the strength of this potential relationship through bivariate analysis, using the ArcGIS Pro program's Local Bivariate Relationships tool. In addition, ANOVA statistical analyses will cross-check the correlation between TSD and below average life expectancy to determine whether minority populations and low-income populations are more likely to have lower average life expectancies. This research will use ArcGIS Pro software to assess the strength of any relationships and visualize them. Research Data will be downloaded from the U.S. Census Bureau, Michigan Department of Environment, Great Lakes and Energy (EGLE), and the State of Michigan.

KIRKHOF CENTER GRR 070

Investigation of The Stereoselective Synthesis of Alkenes Using Compounds Containing Phosphorane Functional Groups

Participants attending 11:00 AM - 12:00 PM
Presenters: Sierra Papa, Brandon Witham
Mentor: John Bender

The investigation is conducted as a group, using a unique starting aniline to make an individualized confirmation of the synthesis. The aim is to confirm the multi-step synthesis of air-stable compounds containing the phosphorane

functional group, and their use in the stereoselective synthesis of alkenes. The results will be analyzed using 15N and 31P NMR to characterize organic and organometallic chemical compounds, structures, additive electronic properties, and reaction rates. The Hammett Postulate will be tested for both 15N and 31P NMR results from the different compounds made as a collaborative group. This will be done by essentially comparing the different NMR chemical shift values. The results and conclusions will be reported at a later date.

KIRKHOF CENTER GRR 071

Investigation of Methods of (P=C) and (C=C) Bond Formation

Participants attending 12:00 PM - 1:00 PM
Presenters: Jacquelyn Adema, Jaden Baldwin, Chloe Spradlin
Mentor: John Bender

The presence of ortho-substituted functional groups on an aniline ring can stabilize phosphorane bonds to make the phosphorane compound air-stable and usable. This project aims to synthesize air-stable phosphorane bonds as a product of multiple unique aniline starting materials and use them to synthesize stereoselective alkenes. First, a reaction will be done between the anilines and maleic anhydride to form maleinilic acid. Next, a dehydration reaction will be done to synthesize an N-phenyl maleimide. NMR tube reactions with triphenylphosphine and bis(diphenyl)phosphinomethane will be done with the N-phenyl maleimides to check the selectivity of phosphorous-carbon bonds, and these reactions will undergo NMR testing to show the results. Last, the products will react with an aldehyde to create unique stereoselective alkenes. The distinct products of the multi-step synthesis will be analyzed via will be analyzed with 13C NMR, 1H NMR, 15N NMR, and 31P NMR to confirm the identity of the product, characterize the molecular properties, and verify that it follows the Hammett Postulate. Results and conclusions will be reported once experiments take place. Conclusions will be drawn comparing the unique structure, stereoselectivity, electronic properties, and reaction rates of the six unique product variants.

KIRKHOF CENTER GRR 072

Exploring the Lexical-Semantic Networks of Words for People in School-Age Children Using Repeated Associations

Participants attending 10:00 AM - 11:00 AM, 2:00 PM - 3:00 PM
Presenters: Rebekah Cole, Ramnit Saini
Mentor: Josita Maouene-Cavin

Having words to talk about people is critical for children's development; however, we know very little about the lexical-semantic organization of this vocabulary. We used a repeated association method with children 7-10 years old. Participants were asked to freely associate about 15 early-learned words for people (grandpa, babysitter) and 6 distracters (pet, bike) and to provide a different response for each of the prompts repeated three times. Analyses reveal that 91% of the responses were valid, with 9% saying "I don't know." We observed that the bulk of the "I don't know" responses were produced towards the end of the list as well as for the second and third associates. Children responded with clangs (sound associations), unique and shared responses, perseverations (using a prompt as an answer), and more nouns than other parts of speech (verbs or adjectives). On average children produced 6.2 words per response, with a range going from 1 word to 23 words, suggesting that it may be difficult for some of them to provide just one word. We created two kinds of networks. The results suggest that the first associates are topologically and chronologically (Age of Acquisition) different from the second and third associates.

KIRKHOF CENTER GRR 073

Effects of Diabetes Education on African American Patients: A Systematic Review

Participants attending 9:00 AM - 10:00 AM
Presenter: Isabella Grady
Mentor: Chad Sutliffe

African Americans are particularly affected by Type 2 diabetes, which constitutes 90-95% of all confirmed cases in the United States (Carter et al., 2013, p. 105). Lacking proper patient education causes decreased diabetes management, which can lead to poor outcomes for diabetic patients. The objective of this systematic review was to determine if there is an association between adult African Americans living in the United States who have been diagnosed with diabetes and are receiving patient education about diabetes and a positive impact on the management of their symptoms. The researchers conducted searches using CINAHL and PubMed databases. After establishing inclusion and exclusion criteria, the team conducted a title review, followed by an abstract review. This resulted in a total of 16 articles that were used by the researchers to analyze the research objective. Eight of the 16 studies found a significant relationship between African American adults living in the United States with diabetes and the management of their symptoms after receiving diabetes education. Due to the positive association between diabetes education and the management of symptoms, African Americans should seek out diabetes education to achieve a manageable, balanced lifestyle.

KIRKHOF CENTER GRR 074

Generational Perspectives of Denglisch in Contemporary Germany

Participants attending 12:00 PM - 1:00 PM
Presenters: Kayla Coats, Natalie VanAtta
Mentor: Dan Brown

Denglisch (Deutsch/Englisch), a hybrid language integrating English words into German sentences, became popular in post-Cold War Germany and continues to gain popularity. Despite the existing research on attitudes toward English in Germany, there is a lack of recent studies specifically exploring the shifting generational attitudes toward Denglisch, a gap this study aims to address. The data collection will unfold in three distinct phases: a pre-survey, a recorded conversation submitted by participants, and a post-survey. The pre-survey will be administered to German individuals varying in age, gender, education level, and self-reported English proficiency. Then, participants will engage in conversations on various topics that are disguised to elicit the use of Denglisch while recording. Analysis of the recorded data will examine the incorporation of English words into the German language context. Subsequently, the post-survey will gather specific insights from participants regarding their perspectives on Denglisch usage and English language influence. Projected results suggest that the older generation is less likely to use Denglisch due to limited exposure to English, while the younger generation with increased educational opportunities and media exposure, is more inclined towards Denglisch usage.

KIRKHOF CENTER GRR 075

Allosteric Inhibitors of Telomerase: Improving the Analysis of Protein-Ligand Docking Data with R

Participants attending 10:00 AM - 11:00 AM
Presenter: Noah Tudor
Mentor: Agnieszka Szarecka

Telomerase extends the telomeric region on chromosomes in rapidly dividing cells and thus prevents chromosomal damage and cell death. Cancer cells overexpress telomerase and use this mechanism to divide indefinitely. Inhibiting telomerase would therefore support anticancer therapies. Currently, no nonnucleosidic telomerase inhibitors, such as BIBR-1532, have passed clinical trials, as all of them showed either toxicity or low efficacy. Thus, the biggest challenge is designing allosteric molecules with improved pharmacokinetics. This research project aims to determine how some of the BIBR-1532 analogs, proposed recently in the literature, bind to the structure of human TEN-TERT domains. I have used the 7TRE structure and a protein-ligand docking program, SwissDock, to predict the binding modes of BIBR-1532 and three analog compounds. SwissDock blind docking runs generate a large number of predicted complexes. I have developed an R program to help identify and extract only the highest-affinity binding poses from a large amount of SwissDock's data. I mapped these poses to my previous data on conserved motifs and putative binding pockets using VMD. The results indicate that several potential binding sites exist for allosteric modulator drugs. This information can be used to better understand the inhibition of telomerase and drug design.

KIRKHOF CENTER GRR 076

The Relationship of the Coronavirus Pandemic on Children's Social Behavior, Depression, and Anxiety

Participants attending 9:00 AM - 10:00 AM, 10:00 AM - 11:00 AM, 11:00 AM - 12:00 PM, 2:00 PM - 3:00 PM, 3:00 PM - 4:00 PM, 4:00 PM - 5:00 PM
Presenters: Luke Gingras, Nicholas Leo
Mentor: Chad Sutliffe

The objective of this study is to determine if there is an association between pandemic lockdowns and higher levels of depression and anxiety in children and adolescents. A scientific study conducted in 2020 surveyed 3055 adults, revealing a 25 percent increase in anxiety and a 41 percent increase in depression during the initial stages of COVID-19. Conducting a systematic review, we hypothesize that there would also be an increase in anxiety, loneliness, depression, and altered social behavior in adolescents as well. Reviewing 20 peer-reviewed journal articles in scientific literature, the research team employed methodology and implemented exclusion and inclusion criteria to test our research question. The results demonstrated that the COVID-19 social isolation lockdown created a generalized increase in anxiety, depression, and loneliness in children.

KIRKHOF CENTER GRR 077

Synthesis of Diphenyl Urea Antibiotics with Chlorine Substitution

Participants attending 12:00 PM - 1:00 PM
Presenters: Ian Abbott, Morgan Gartland, McKenzie Johnson, Addison Whitten
Mentor: Matthew Hart

In this project, various target diphenyl ureas will be synthesized and analyzed to measure their antibiotic effectiveness. Specifically, these compounds will be analyzed for their effectiveness at treating tuberculosis infection. These ureas will be prepared via a nucleophilic acyl substitution between acid chloride and dimethylethylenediamine to form a nitrobenzamide derivative. The nitro group will be reduced by catalytic hydrogenation to form an aniline derivative. This aniline derivative will then be reacted with an isocyanate bonded to a chlorinated aromatic system. The chlorine substitution is either ortho, meta, or para or 3,4-dichlorinated to form our target urea molecules. All synthesized molecules will include an amide chain substituted on the meta position of "Ring B". Structures will be confirmed using C-NMR, H-NMR, and GC/MS. The results of these experiments will be reported herein. It is hoped that the differing structural changes in our molecules can help to improve the process of making new drugs to treat TB.

KIRKHOF CENTER GRR 078

Breaking the Silence: Cultural Perspectives on Taboo Language

Participants attending 12:00 PM - 1:00 PM
Presenter: Rachel McFall
Mentor: Dan Brown

Vulgar language often stems from societal taboos, reflecting cultural attitudes toward perceived immorality. In patriarchal societies, feminine traits are frequently disparaged, leading to the prevalence of gender-based insults targeting women. This study aims to elucidate the link between misogyny and such language, ideally aiding in the liberation of women from internalized social stigma. This survey study will investigate the perceived severity of taboo words among progressive queer individuals and conservative churchgoers. The Christian church tends to endorse patriarchal views and rigid gender norms, while the queer community advocates for gender fluidity and equality, making these communities of practice ideal subjects. The research includes questions assessing the participent's religious status, sexuality, and gender identity in order to ensure the use of data that fits most accurately within the parameters. A general situation will be detailed in which a taboo word is used, and participants will rate how negatively or positively they view the word within that context on a scale of 1 to 5. The anticipated outcome is that the conservative community will rate female-related vulgar terms more harshly than their liberal counterparts.

KIRKHOF CENTER GRR 079

Down-regulation of Connexin43 (Cx43) in Human Adipose-Derived Stem Cells (hADSC) Preserves Cell Viability in Hypoxia

Participants attending 2:00 PM - 3:00 PM, 3:00 PM - 4:00 PM
Presenters: Madison Bohatuk, Megan Bohatuk
Mentor: David Geenen

It has been reported that adult somatic stem cell therapy can be beneficial for cardiac muscle recovery following

injury to the heart. A common problem with various approaches to this therapy has been the early (< 24 hrs) loss of a large percentage of the implanted stem cells, decreasing their therapeutic potential. We and others have demonstrated that cell-cell coupling occurs within hours after co-culturing stem and cardiac muscle cells and that gap junctions composed of Cx43 participate in this cell coupling. Thus, we hypothesize that gap junctions may act as conduits for molecular apoptotic signals from injured cardiac muscle cells and affect the viability of implanted stem cells. In our initial experiments, we will transfect hADSC with a Cx43 siRNA and downregulate the expression of this protein thereby reducing the formation of gap junctions in the hADSC. We will use flow cytometry analysis to determine hADSC transfection efficiency and immunoblotting to determine the level of Cx43 protein down-regulation in the hADSCs. Further studies will examine the viability of the transfected hADSCs when co-cultured with cardiac muscle cells in a hypoxic environment.

KIRKHOF CENTER GRR 080

Supporting Individuals Aging in Place

Participants attending 9:00 AM - 10:00 AM
Presenter: Allison Klimek
Mentor: Jing Chen

The aging process proposes a unique dilemma of where to live to best support possible life changes and different needs that come with age. “Aging in place” is the concept of older adults remaining in their homes and communities safely regardless of age, rather than moving to a long-term care community. This presentation will discuss aging in place and the supports needed for older adults to safely reside in their homes and remain connected in their communities.

KIRKHOF CENTER GRR 081

Research Methods Used to Investigate the Pathophysiology of Parkinson’s Disease

Participants attending 1:00 PM - 2:00 PM
Presenter: Akash Ranabothu
Mentor: John Capodilupo

This work is for an independent research credit that is co-mentored by Dr. Benskey at the MSU Research Center and Dr. Capodilupo at Grand Valley. I am using a microtome to slice rat brains to obtain samples of the hippocampus and the substantia nigra. Additionally, I am tracing brains to observe any melanin staining differences between the control brains and brains affected by Parkinson's disease.

KIRKHOF CENTER GRR 082

The Influence of Screen Time on Participation in Physical Activity for Children with a Physical Disability: A Literature Review

Participants attending 3:00 PM - 4:00 PM
Presenter: Alexis Phillips
Mentors: Krisanne Chapin, Colleen Lewis

Children and adolescent participation in physical activity is influenced by a plethora of factors. A physical disability can act as a barrier, preventing participation in physical activity. However, external assistance, often provided by family members, can help those with a physical disability to be physically active. Contrary to familial involvement, technology has detracted from participation in physical activity. Regardless of a physical disability, technology is easier for children/adolescents and their families to spend time on, compared to physical activity. A literature review was conducted to determine the interaction between physical activity and screen time. The aim of this study is to highlight the importance of family influence and the effects of technology on physical activity levels.

KIRKHOF CENTER GRR 083

Japanese Language and Dialogue with English Native Speakers

Participants attending 10:00 AM - 11:00 AM, 11:00 AM - 12:00 PM, 2:00 PM - 3:00 PM, 4:00 PM - 5:00 PM
Presenter: Y Hong Nhu Nguyen
Mentor: Anthony Spencer

Learning a second language creates a window to another culture, offering a dialog between the language learner and the new culture. During the process of language learning and cultural immersion, our worldview changes as well. In order to better explore this concept, I focus on Japanese-language learners at a midwestern university. I chose Japanese because of the vast differences in language, writing system, and cultural practices for native English speakers. If you know the Latin alphabet you can use phonics to guess how to pronounce unknown English words. However, Japanese uses multiple scripts, including ideographic and pictographic writing, which does not allow for guessing of words based on sounds. Thus, unknown word pronunciation does not work the same. I want to know what strategies or techniques native English speakers use when interacting with the Japanese language, and what that means for subsequent interactions with the Japanese culture. My corpus of data includes in-depth interviews with beginner-level Japanese-language students and supplementary artifacts such as textbooks, class notes, and other auxiliary data which nuance the interviews.

KIRKHOF CENTER GRR 084

Exploring the Causal Relationship Between Lack of Control in One’s Life and Conspiratorial Beliefs

Participants attending 9:00 AM - 10:00 AM, 10:00 AM - 11:00 AM, 11:00 AM - 12:00 PM, 12:00 PM - 1:00 PM, 3:00 PM - 4:00 PM, 4:00 PM - 5:00 PM
Presenters: Elias Ghazal, Mya Hanna, Joshua Kopich, Tessa Kramer
Mentors: Brian Bowdle, Mario Fific

Exploring the individual tendency towards embracing conspiratorial beliefs presents a considerable challenge for researchers, frequently uncovering weak and inconsistent correlations with factors such as personality traits, perception of cognitive processes, decision-making capabilities, and sensory sensitivity. A major limitation of these research is its reliance on correlational, self-report measures. To address this gap, our study introduces an experimental approach, the "Broken Fridge" task, designed to place participants in a scenario where they must attempt to

control the temperature of a refrigerator. This setting uniquely positions participants to experience a loss of control, thereby allowing for a direcassessment of the locus of control. Our methodology aims to provide more detailed insights into the effect of individual's locus of control and their propensity towards conspiratorial beliefs. This experimental procedure not only circumvents the limitations of traditional self-report measures but also offers a novel perspective on the intricate dynamics underlying the formation of conspiratorial thinking. Through this approach, our study aims to illuminate the detailed interplay between psychological control and the endorsement of conspiracy theories, offering a more robust understanding of the factors that contribute to conspiratorial beliefs.

KIRKHOF CENTER GRR 085

Synthesis of Potential Tuberculosis Antibiotics: A Comparison of Novel Diphenylureas

Participants attending 12:00 PM - 1:00 PM
Presenters: Allison Doyon, Annika Hawley, Thien Anh Hoang, Ciara Keenan
Mentor: Matthew Hart

Tuberculosis (TB) is a bacterial infection that primarily targets the lungs but can attack any part of the body. TB was estimated to have caused 10.6 million infections in 2022 and was the second leading infectious killer after Covid-19. Many antibiotics used to treat TB are ineffective in the face of antibiotic resistance, necessitating research for further development of new antibiotics. The objective of this project is to compare the effects of electron withdrawing versus electron donating groups attached to Ring A of the lead structure, as well as the effects of para versus meta-addition of the amide group attached to Ring B. The structures will be confirmed using 1H-NMR, 13C-NMR, and IR data. Results and conclusions will be reported on the basis of designing new drugs to treat tuberculosis.

KIRKHOF CENTER GRR 086

Integrating Data and Unraveling the Tumor Microenvironment: Advancing Personalized Medicine Strategies in Triple-Negative Breast Cancer

Participants attending 10:00 AM - 11:00 AM
Presenter: Subrahmanya Charitha Kodumagulla
Mentor: Suhila Sawesi

Triple-Negative Breast Cancer (TNBC) presents a significant clinical challenge due to its lack of three key receptors and the resulting absence of targeted therapies. Recognizing the critical need for a deeper understanding of TNBC's molecular heterogeneity, this ongoing study employs a meta-analytic approach to RNA-seq datasets, with the goal of elucidating the diverse genetic and molecular mechanisms at play. We systematically gather TNBC-specific RNA-seq datasets from various repositories, ensuring uniformity and comparability through normalization and re-processing. Short-term objectives include integrating patient outcomes in this challenging landscape.

KIRKHOF CENTER GRR 087

Reinvigorating Immune Function in High-risk Childhood Leukemia

Participants attending 11:00 AM - 12:00 PM
Presenter: Vincent Sartori
Mentors: Nathaniel Buteyn,

Leukemia patients with a chromosome 16-21 translocation, yielding the FUS::ERG oncoprotein, have dismal outcomes and a lack of immunogenicity associated with overexpression of EZH2, a histone methyltransferase. We treated FUS::ERG cell lines with the EZH2 inhibitor tazemetostat, with interferongamma, and with the Menin inhib tor VTP50469 to investigate whether patients with this lesion could be rendered immunogenic for stem cell transplantation. Our previous work has demonstrated strong results for the combination of EZH2 inhibition and interferon-gamma (associated with donor lymphocyte activation) in the TSU-1621MT FUS::ERG cell line; we now report new results from the treatment of an additional model, the YNH-1 cell line, with the same combinatorial therapy and investigate VTP50469's effect in both models.

KIRKHOF CENTER GRR 088

Peru: Solidarity over Charity

Participants attending 11:00 AM - 12:00 PM
Presenter: Angie Leedy
Mentor: Jamie Langlois

Global leadership and intercultural development go hand in hand. Students who study abroad learn from governmental, non-governmental, and social welfare organizations in addition to neighborhood groups and service learning opportunities in new cultural contexts. Experiential learning allows students to appraise their Western values and to assess the role of privilege in the communities of study. Grand Valley State University's School of Social Work will offer a study abroad program focused on this issue in Lima, Peru for the first time during the Spring/Summer 2024 semester. Dialogue with local university students will identify culturally relevant theories utilized in service delivery. Interaction with local initiatives will highlight the interconnectedness between social work, social justice, and civic/global responsibility. Program participants will learn about the social, economic, and political welfare of Peru and the history of its culture. Critically evaluating the distribution of power and privilege cross-culturally and within the United States will prepare future professionals to promote social, racial, economic, and environmental justice, reduce inequities, and ensure dignity and respect for all.

KIRKHOF CENTER GRR 089

Cannabinoids Influence on Eating Motivation in Rodents

Participants attending 1:00 PM - 2:00 PM
Presenter: Lauren Lefevre
Mentor: Natashia Swalve

Many states and nations are beginning to legalize marijuana for medical and recreational purposes, yet it is still illegal at the federal level. Due to marijuana's federal status, little is known regarding the effects of cannabinoids, the psychoactive compounds in marijuana that produce its effects, especially how it affects feeding-related motivation. The most widely recognized component in marijuana is delta-9- tetrahydrocannabinol (THC) but an additional cannabinoid, cannabidiol (CBD) is also understudied. Examining whether particular compounds affect an individual's

desire to eat may help determine whether cannabis can be used therapeutically or whether it has adverse impacts. This study will explore the effects of cannabinoids, both alone and in combination, on feeding motivation. Rats will be trained to lever press for sucrose. They will then be assigned to four groups: WIN55,212-2 (a cannabinoid similar to THC), CBD alone, WIN+CBD, and saline. They will be tested on a progressive ratio schedule, with the schedule increasing daily until they reach breakpoint, the point at which rats quit working for the reinforcer (e.g. 32 lever presses for one reinforcer). We will compare the breakpoints among the groups to see if cannabinoids affect the motivation to respond to a food reinforcer.

KIRKHOF CENTER GRR 090

Digital Health Literacy: Analyzing Patient Characteristics and Their Influence on Utilizing Online Platforms for Medication Information

Participants attending 10:00 AM - 11:00 AM
Presenter: Venkata Jagadish Mandava
Mentor: Suhila Sawesi

In the digital age, understanding patient engagement with online health information is imperative. Our study investigates the demographic and health-related predictors that influence patients' use of digital platforms for medication information. Employing a proprietary dataset from a comprehensive 2021 survey of 26,173 Americans, we analyzed digital platform usage for health literacy, spanning web searches, apps, websites, and social media. Key variables included demographic details, health status, and digital health service history. Chi-square and logistic regression analyses determined the predictive significance of these variables on digital platform use. Results indicated that 39.58% of participants engaged with digital platforms for health information. Predominantly, users were white females, with statistical tests revealing a significant correlation between platform use and factors like age, education, geographical location, and chronic illness prevalence ($P < 0.05$). Notably, having multiple chronic conditions (OR 1.085), higher education levels (OR 1.352), and racial demographics (OR 0.901) were substantial usage predictors. Conclusively, our findings highlight an evident trend: patients with more education and chronic conditions, particularly within certain racial demographics, are more inclined to utilize digital resources for medication information. These insights are pivotal for tailoring effective digital health literacy programs to improve accessibility and utilization of online health resources.

KIRKHOF CENTER GRR 091

The Effects of Acute Exposure to β(beta)-estradiol on Crayfish Behavior and Gonadal Structure

Participants attending 3:00 PM - 4:00 PM, 4:00 PM - 5:00 PM
Presenter: Alyson Furstenau
Mentor: Daniel Bergman

An essential aspect of crayfish survival is the ability to find a mate and reproduce. If these abilities are negatively impacted, then a decrease in crayfish populations is likely to occur. Although estrogen is found in both male and female crayfish, an increased concentration has the potential to feminize the male sex organs and lead to reduced fertility. 17ß(beta)-estradiol (E2), a natural estrogen, has entered many of our local bodies of water via sewage effluent. In this experiment, we exposed male and female crayfish to acute levels of 17ß(beta)-estradiol, and then observed whether they could distinguish male and female odors, as well as the attractiveness of each odor. Hemolymph extractions were utilized to assess the bioaccumulation of estradiol, and in future research, gonads from chronically exposed crayfish will be analyzed to detect alterations in structure and size. We hypothesized that acute exposure to ß(beta)- estradiol would negatively impact crayfish when attempting to find a mate and potentially result in bioaccumulation over the exposure period.

KIRKHOF CENTER GRR 092

Nuclear Magnetic Resonance Study of Caffeine Dimerization

Participants attending 10:00 AM - 11:00 AM, 11:00 AM - 12:00 PM
Presenter: Savannah Dzumaryk
Mentors: Ryan Hoekstra, Stephanie Schaertel

We determined the caffeine dimerization equilibrium constant K at various temperatures using NMR titrations; peak locations changed when total caffeine concentration was varied. Our fitting equation assumed 2CÌC2 , where C represents caffeine. Our K values differ from those of previous researchers who used a less sensitive NMR, but our values were in the same range as earlier values. Using Van't Hoff plots, we found the standard enthalpy change ΔH° and standard entropy change ΔS°. ΔH° found using the average of K values obtained by analyzing chemical shifts from four types of caffeine protons was (-11.31 ± 0.89) kJ mol-1; ΔS° was (31.2 ± 2.8) J mol-1 K-1. We also studied the effect of sucrose concentration on caffeine dimerization. K values at 0, 20.0, and 100. mM sucrose were (4.21±0.62) M-1, (5.22±0.82) M-1, and (3.79±0.97) M-1. The effect of sucrose was arguably so small as to be not statistically significant, in contrast to predictions in published computational chemistry studies.

KIRKHOF CENTER GRR 093

Melatonin Effects on Cholinergic Modulation of Dopamine Signaling

Participants attending 9:00 AM - 10:00 AM
Presenter: Sydney Zimmerman
Mentor: Eric Ramsson

Acetylcholine (ACh) and dopamine (DA) have a complicated relationship. It has been proven that DA causes a decrease in ACh release in the brain (Surmeier and Graybiel 2012). It has also been proven that ACh interneurons cause spontaneous DA release (Yorgason et al. 2017). Recent studies have shown that ACh interneurons are on a diurnal (daytime) schedule and that there is a change to DA signals that is dependent on the time of day (Stowe et al. 2022). It is possible that this diurnal schedule could be connected to melatonin, which also changes throughout the night/day cycle and drives circadian changes. Our lab has been working on a project studying the effects of melatonin on DA transmission in the brain (a region called the striatum). We discovered that melatonin causes a decrease in DA release. To expand further on the melatonin project, we believe that melatonin could be one of the diurnal factors causing cholinergic interneurons to affect DA activity. This could mean that time of day affects habit formation or movement, two things involving the striatum.

KIRKHOF CENTER GRR 094

Revolutionizing Patient Access with Secure Single Sign-On: Leveraging C# and SQLite for Enhanced Password Management.

Participants attending 12:00 PM - 1:00 PM
Presenter: Sundeep Gantyada
Mentor: Suhila Sawesi

This project aims to develop a secure, streamlined password management tool, meticulously tailored for digital healthcare platform users, addressing the prevalent challenge of managing multiple passwords. By leveraging the robust security features of C# for backend development, employing SQLite for its lightweight yet powerful data management capabilities, and applying advanced AES encryption alongside SSL/TLS protocols, this initiative guarantees the highest levels of data security and integrity. The primary objectives of this ambitious project are threefold: firstly, to create a highly intuitive, user-friendly password management system that prioritizes ease of use; secondly, to significantly enhance patient access to health records and services, thereby improving the overall patient experience in the digital healthcare domain; and thirdly, to design and integrate a system with the potential for future evaluations of regulatory compliance, particularly with regard to healthcare standards. The overarching long-term goal of this endeavor is to assess the tool's usability and explore its compliance with stringent healthcare regul tions like HIPAA. This careful and deliberate approach aims to substantially improve the online healthcare management experience for patients, simplifying access to vital services while maintaining high security and privacy standards.

KIRKHOF CENTER GRR 095

Examining the Association of Herbal Supplement Usage with Cancer Incidence

Participants attending 2:00 PM - 3:00 PM
Presenter: Bushra Rashrash
Mentor: Suhila Sawesi

Previous research has suggested a potential protective effect of herbal supplements against cancer. In this analysis, we aimed to evaluate whether previous use of herbal supplements is associated with a decreased risk of cancer among participants in a population-based study. This study analyzed a proprietary dataset provided by the original researchers, which consisted of responses from a cross-sectional online survey of 1522 U.S. participants in 2021, comprising 192 cancer cases. Structured interviews were conducted, and 633 participants reported previous use of herbal supplements. Cancer status was determined based on participants' self-reported diagnoses. Our analysis revealed a significant association between previous use of herbal supplements and current cancer status ($\chi^2 = 4.42$, $p = 0.03$). Among individuals with current cancer, 5% reported previous use of herbal supplements, compared to 37% among those without cancer. Our findings suggest that previous use of herbal supplements may be associated with a decreased risk of current cancer status. Further research is warranted to confirm these observations and to elucidate the potential mechanisms underlying this association. Understanding the role of herbal supplements in cancer prevention may have important implications for public health strategies.

KIRKHOF CENTER GRR 096

Supporting Black Men's Mental Health at Grand Valley State University

Participants attending 9:00 AM - 10:00 AM
Presenter: Breanna Wallace
Mentor: Jakia Marie

This project focuses on the impact of Grand Valley State University (GVSU) on the mental health of African American men through structured interviews. The specific list of questions offers students to engage in the topic and take it where they want it to. These questions delve into the participants' experienced, challenges, opportunities, and coping mechanisms within the university. The purpose of it is to reveal how African American men's mental health is at the university and gain insight into the intersectionality of race, gender, and mental health. It provides positive and negative influences such as support systems, cultural representation, and information on social environments. By gathering data and analyzing it, the research will contribute toward understanding the experiences of African American men at GVSU. The findings will then offer insight into the implications that need to be conducted for campus to promote mental health and inclusivity.

KIRKHOF CENTER GRR 097

Disruption of Genes Necessary for Histamine Metabolism to Determine which Histamine Metabolite is Present in Male Accessory Glands of Drosophila melanogaster

Participants attending 11:00 AM - 12:00 PM
Presenter: Marie Adinolfi
Mentor: Martin Burg

Histamine is a neurotransmitter in Drosophila melanogaster that can be metabolized into carcinine (by the enzyme encoded by the ebony gene). Carcinine can then be converted back to histamine (by the enzyme encoded by the tan gene). N-acetyl histamine (NAH), another histamine metabolite, has been identified in the male accessory gland, which also exhibits high levels of “histamine-like immunoreactivity” (HLI). The histamine antibody that was used detects all 3 histamine metabolites, so it is not known which metabolite was being detected in this tissue. The AANATL-7 gene, expressed in accessory glands, is likely responsible for acetylating histamine. Thus, disruption of the AANATL-7 gene should reduce the detection of this metabolite in the accessory gland. AANATL-7 was initially disrupted using RNA interference (RNAi) to determine its effects on HLI in accessory glands, which resulted in a significant HLI signal reduction. More recently, disruption of the AANATL-7 gene by mutation confirmed that the HLI detected in the accessory gland was due to the presence of NAH, but not carcinine or histamine. Currently, accessory glands from tan and ebony mutants are being similarly examined to determine whether there is any reduction of HLI in these mutants as was seen in the AANATL-7 mutant.

KIRKHOF CENTER GRR 098

Analyzing Animal Resources in the Archaeological Record: Zooarchaeology at the Site of Tel Dan, Israel

Participants attending 1:00 PM - 2:00 PM
Presenter: Hannah Horvath
Mentors: Elizabeth Arnold, Jonathan Greer

In zooarchaeology, the study of animals remains in the archaeological record, the question of how people manage their animal resources, both domestic and wild, is central to the study of their interactions with the landscape, social organization, resilience, and long-term sustainability. This project details the zooarchaeological analyses from the site of Tel Dan, Israel. Tel Dan has a long archaeological history with remains from the Neolithic through early modern periods. Its location at the source of the perpetual Dan spring—one of the headwaters of the Jordan River—has long attracted inhabitants who eventually benefited from the strategic location the crossroads of several ancient routes. The project will go beyond the simple documentation of presence/absence of animals to examine how animal resources are distributed within society and their manipulation in economic, political and/or social arenas. This research looks not only at animals as food resources but also as key items of trade and exchange and as symbols of wealth and/or status.

KIRKHOF CENTER GRR 099

Trait Mindfulness

Participants attending 2:00 PM - 3:00 PM
Presenter: Julia Korol
Mentor: Amanda Dillard

Mindfulness is defined as the ability to bring one's attention to the present moment, without judgement (Sala et al., 2020). Trait mindfulness refers to individual differences in general mindfulness across different situations and time (Sala et al., 2020). Research has shown that there are many psychological benefits to being higher in trait mindfulness including decreasing stress, anxiety, and depression (Dillard & Meier, 2021). However, less is known about how trait mindfulness is associated with physical health including daily symptoms and health behaviors. Previous studies have also tended to use cross-sectional rather than prospective designs. In this study, we investigated the relationship between college students' trait mindfulness, physical health and health behaviors over a period of two months. Along with assessing bivariate associations between trait mindfulness, physical symptoms, and health behaviors, we examined if trait mindfulness predicted these health variables overtime. We surveyed students at multiple time points across the semester. Trait mindfulness was measured using the Mindful Awareness and Attention Scale (MAAS; Brown & Ryan, 2003) and physical symptoms (e.g. headaches and abdominal cramps) were measured using a symptoms checklist. Health behaviors such as sleeping and exercise were also measured using previously validated scales. Findings and implications will be discussed.

KIRKHOF CENTER GRR 100

The Role of α-Synuclein in Parkinson's Disease

Participants attending 1:00 PM - 2:00 PM, 2:00 PM - 3:00 PM, 3:00 PM - 4:00 PM, 4:00 PM - 5:00 PM
Presenter: Arash Kordbacheh
Mentor: John Capodilupo

α-Synuclein is a protein linked to Parkinson's disease. We have investigated the role of synucleinopathy induced CD55 dysfunction in alpha synuclein associated toxicity. This presentation will explain the basic pathology and anatomy associated with Parkinson's disease. Also, it will explain the compliment system and the role of CD55, as well as how CD55 dysfunction impacts the compliment pathway. Additionally, we will speak on the role of α-Synuclein in Parkinson's, specifically how it is correlated with the compliment system. This allows us to develop a better understanding of how the neuro-pathology of Parkinson's disease works.

KIRKHOF CENTER GRR 101

Using GIS To Analyze Seasonal and Temporal Changes in Algae Levels in Lakes in Ottawa County, MI

Participants attending 1:00 PM - 2:00 PM
Presenters: Ashtyn Gluck, Alexandra Jorns
Mentor: Peter Wampler

In 2022 students from GEO425 Advanced GIS Applications in Geology digitized and compiled data for over 5000 lakes in Ottawa County. The outlines of these lakes, combined with aerial photos, can be used to infer algal concentrations using changes in color of the lakes in the images. Using remote sensing techniques, we will perform a color analysis using auto-classification tools to estimate algae growth. Aerial photos taken during different seasons, and over a period of years, will be used to determine seasonal changes in algae and how algae growth is changing over time. It may also be possible to determine the spatial distribution of algal concentrations. These results may be used to guide future efforts to improve water quality through green infrastructure and other water management improvements.

KIRKHOF CENTER GRR 102

Synthesis of Antibiotics to Treat Tuberculosis with Electron Donating Groups.

Participants attending 1:00 PM - 2:00 PM
Presenters: Brady Curtin, Robert Dean, Mitchell Goerge, Jenna Gutting, Grace Puckett
Mentor: Matthew Hart

Tuberculosis is the world's leading infectious killer, responsible for approximately 1.5 million deaths per year. The development of novel drugs is key to treatment as tuberculosis continues to adapt and become more antimicrobial-resistant. Computational analysis and organic synthetic chemistry techniques, including alkylation of a phenyl group and nucleophilic aromatic substitution, were used to prepare diphenyl urea antibiotics. Five urea derivatives are being synthesized to investigate the effects of electron donating groups; the functional groups in question are o/m/p methyl groups, para methoxy, and a 3,4- dimethoxy group. In addition to these functional groups, a dimethylaminopropyl chain is also being studied in the para position on the other end of the molecule. Results will be confirmed via 1HNMR, 13CNMR, IR, and mass spectroscopy. The results and conclusions will be reported, and further tested on tuberculosis to determine if the newly synthesized product is capable of being an effective inhibitor of tuberculosis.

KIRKHOF CENTER GRR 103

A Case Study of Myofascial Pain Syndrome

Participants attending 2:00 PM - 3:00 PM
Presenter: Kiera Welden
Mentor: Brian Kipp

Myofascial Pain Syndrome is a chronic pain diagnosis that directly affects the muscles and fascia. Patient X is the center of this case study and represents a typical individual with MPS. The common symptoms of muscle pain, migraines, and referred pain are present. Pain ranges from daily minor pain to intense debilitating pain. Symptoms can be managed with a daily prescription of Baclofen and Naproxen for relief during pain crises. Routine visits to a pain clinic and alternative treatments such as massage and dry needling are sometimes helpful in alleviating symptoms. This review will also explore the currently known pathophysiology of Myofascial Pain Syndrome through Patient X's experiences as well as explore emergent treatments.

KIRKHOF CENTER GRR 104

Repercussions of Negative Aging Stereotypes

Participants attending 9:00 AM - 10:00 AM
Presenter: Esther Belli
Mentor: Jing Chen

Negative stereotypes regarding aging affect the way people of all stages of life view their present, past, and future. Many businesses and organizations capitalize on the fear of aging created by some of these negative stereotypes and make a profit in all kinds of anti-aging practices. Environment and culture may directly influence the way the older generation is seen not only by the younger generation but also by themselves. The mental health and physical health of the older generation can be affected by assumptions made regarding their capabilities and so-called limitations. This presentation will explore the repercussions of stereotypes placed on aging by media, societies, and communities that view aging in a negative manner. Furthermore, this presentation will discuss the common misconceptions of aging and how these might be combatted.

KIRKHOF CENTER GRR 105

Analyzing the Representation of Black Women in the Black Panther Films

Participants attending 1:00 PM - 2:00 PM
Presenter: Shajuana Johnson
Mentor: Leifa Mayers

Throughout history Black women had been represented in negative and dehumanizing ways in films like;the mammy, oversexualized, sassy, etc. This is an important topic because getting rid of these negative stereotypes can help empower and inspire a new generation of young black women by validating their stories. In this paper I will argue that stereotypes of Black women changed over the years with the help of Marvel's Black Panther and Black Panther: Wakanda Forever. Using textual analysis, I looked for stereotypes and how Black women are portrayed in the films. I will focus on the stereotypes that were used to portray Black women, how this has changed over the years and how the Black Panther films removed these negative stereotypes. Anticipated findings include subtle stereotypes such as uneducated/unintelligent, angry black woman, and strong black woman. The women in these films are essentially the spine to the main character by helping him make difficult choices while also being there to support him in whatever he decides to do. The importance of my project is to look scene by scene in both movies and see first-hand how Black women were shown and to see if the movies actually got rid of these stereotypes.

KIRKHOF CENTER GRR 106

Effects of Storage Conditions on Stability of Laboratory Specimens

Participants attending 9:00 AM - 10:00 AM, 10:00 AM - 11:00 AM
Presenters: Mariam Ayad, Emily Baumeister, Savannah Schwarzwalder
Mentor: Dana Vaughan

This literature review aims to answer the question of how storage conditions affect the accessibility, accuracy, and stability of patient samples within the clinical laboratory. The data used for this research was sourced through Google Scholar, Pubmed, and GVSU databases, utilizing the keywords such as "specimen storage", "sample stability", and "laboratory specimen". The findings throughout the articles indicated significant stability variations of multiple analytes under different storage temperatures and durations. As certain analytes remained stable for testing, others degraded rapidly under less preferable specimen conditions. Moreover, findings highlight the importance of storage protocols ensuring the reliability of laboratory test results, and enhancing overall patient care.

KIRKHOF CENTER GRR 107

Food Allergies and Campus Dining at GVSU Study

Participants attending 2:00 PM - 3:00 PM
Presenter: Elena Chiu
Mentor: Coeli Fitzpatrick

GVSU is failing its students with food allergies by not providing the proper accommodations in Campus Dining facilities. This paper starts with a brief look into the Americans with Disabilities Act, then provides the experience of two students with food allergies' struggle to eat at GVSU and to show the issues and why they need to be fixed. This is followed by a comparison of GVSU's dining program and the highest ranked food allergy safety university, MSU. Using MSU's program as a framework, multiple solutions, such as creating stable meal options and displaying ingredients online are provided to create a Campus Dining program that is safer and more accommodating to students with food allergies.

KIRKHOF CENTER GRR 108

The Clinical Effects of Gender Reassignment

Participants attending 11:00 AM - 12:00 PM, 12:00 PM - 1:00 PM

Presenters: Ellise Bush, Curtis Pek, Tyler Staley
Mentor: Dana Vaughan

Gender transition is spectrum of legal, social, and medical processes that aim to affirm one's gender identity and ameliorate dysphoria. Gender transition may include updating legal documents, personal pronoun/title use, shifts in personal styling, and/or gender affirming medical care, such as hormone therapy, or surgery. Our research focuses on how gender affirming medical care processes impact life expectancy, laboratory reference ranges, and body chemistry. Our data was gathered from peer reviewed articles found on multiple medical research databases, such as PubMed. Through our investigation, we discovered a correlation between accessing gender affirming medical care and changes in body chemistry and lab values. Understanding how the process of transitioning may modify a patient's physiological features, and how their body chemistry may produce lab values both within and outside of currently utilized male/female binary reference ranges, is an important implication of this research. Education of clinicians is also a shortcoming that will be discussed, along with the need for improved clinical diagnostics for all.

KIRKHOF CENTER GRR 109

Diabetic Testing Methodologies in Correlation with Patient Outcomes

Participants attending 12:00 PM - 1:00 PM, 1:00 PM - 2:00 PM
Presenters: Skylar Brouwer, Garrett Ebenhoh, Maria Gasparotto
Mentor: Dana Vaughan

technologies and methodologies for diagnosis and monitoring of diabetes. We looked at past, current, and upcoming methods and their correlation with clinical outcomes. For resaerch, PubMed, CINAHL Complete, and Explora databases were used to gather peer-reviewed data evaluating how diabetic testing methodologies relate to patient outcomes. We found that compared to technology of the past, there are promising new test methodologies and interventions such as pancreas transplants and more comprehensive glucose monitoring that give new hope to current diabetic patients.

KIRKHOF CENTER GRR 110

Interaction Of Trace-Amine Associated Receptor 1 And Mu-Opioid Receptor Influence On Motivational Behaviors And Thermoregulation

Participants attending 11:00 AM - 12:00 PM
Presenter: Delaney Rush
Mentor: Shkelzen Shabani

The mu-opioid receptor systems mediate rewarding effects, and also contribute to methamphetamine (MA) consumption-related behaviors. Selective breeding based on MA consumption trait discovered two genes influencing several MA-related traits. These genes are: trace-amine associated receptor 1 (Taar1) and mu-opioid receptor 1 (Oprm1). In the first study, we used a conditioned place preference (CPP) procedure to determine whether the selective TAAR1 agonist, RO5256390, blocks rewarding effects of morphine. Mice were first injected with 0 or 0.1 mg/kg RO5256390, and 15 minutes later with 0 or 10 mg/kg morphine, then placed in a CPP apparatus for conditioning trials. One day after preference testing, after the same injections, animals had rectal temperature measured immediately before morphine injection (time 0 min) and at 60, 120 and 180 min after injection. In a second study, we used multiple doses of each drug to determine thermal effects after injections. RO5256390 plus morphine induced rewarding effects only when drugs were given prior to the preference test. In the first study, RO5256390 alone induced hypothermia; however, RO5256390 plus morphine induced greater hypothermia. Similar results were obtained in the second study. These studies indicate that the interaction from activation of these two receptors determine drug-related motivational and physiological outcomes.

In-Person Oral and/or Visual Presentation

BEGINNING AT 9:00 A.M.

KIRKHOF CENTER 1142

A Statistical Consulting Experience: Studying the Effects of FIT Clases on Academic Performance and Well Being

Presenters: Michael Heylmun, Jacob Maring
Mentor: John Gabrosek

This analysis was performed with the Movement Science department of Grand Valley State University. The university offers an increasingly long list of FIT classes available for students of all class standings to take. Most students tend to take these classes their freshman year of college, with a low percentage of students that repeat these types of classes into their academic career. The goal of this project is to prove whether or not these FIT classes have had a significant impact on both academic performance and well-being of the students at large.

KIRKHOF CENTER 2201

Impact of Culture and Socioeconomic Status on Paradoxical Vocal Fold Motion and its Intervention

Presenter: Lauren Gutierrez
Mentor: Srihimaja Nandamudi

Paradoxical Vocal Fold Motion (PVFM, also known as Vocal Fold Dysfunction) is a disorder causing ineffective movement of the vocal folds, two tissues located in the larynx. The vocal folds vibrate to produce voice, but they also play an important role in respiration. Normally, the vocal folds abduct during inhalation, but PVFM causes them to adduct toward the midline, narrowing the airway and causing dyspnea, cough, wheezing, and psychological distress. There are a variety of triggers for PVFM, including smoking, allergens, physical activity, and stress, and PVFM can result in a decrease in quality of life.

Socioeconomic status can affect a person's ability to access information, care, and treatment of the disorder, and where an individual lives may determine if they are able to manage their PVFM. The purpose of our research is to investigate populations affected by PVFM: athletes, high-functioning, and/or "typeA" students as well as to spread awareness about the condition. We are interested in the impact of a person's home on their knowledge and management of PVFM. This descriptive study will involve data collection through an online survey and discussion of the results.

KIRKHOF CENTER 2266

Investigating New Radiocarbon Dating Technique

Presenter: Sofiia Svyryd
Mentor: Alexey Nikitin

Traditionally, radiocarbon dating of bone and teeth involves dating of the organic materials such as bone or dentin collagen. In the absence of collagen (due to preservation issues or small sample size) other techniques can be used. In the Molecular Archaeology lab at GVSU we examine ancient human bone and teeth samples from the North Pontic Region in Ukraine to understand population dynamics in that area. Two of the samples we have came from a Neolithic (6th millennium BCE) cemetery excavated in 1930. In this burial there were two individuals– an adult and a child. The adult was radiocarbon dated using dentin collagen, but there was no collagen remaining in the child's tooth. The radiocarbon lab suggested dating inorganic fixed carbonate that comes from the sample, rather than the organic carbon. The method showed to be successful in dating modern human samples, but its use on ancient samples is not well tested. Dating inorganic carbonate in the child's tooth produced a date much younger than the date from dentin collagen in the adult's tooth. The younger than expected radiocarbon date is likely a result of contamination of inorganic carbonate by modern carbonate in the soil.

KIRKHOF CENTER 2270

Assessing the Accuracy of Tree Geometry Measurements from Photos Taken with Common Handheld Cameras

Presenter: Caitlin Cooper
Mentor: Gary Greer

Past and current study of tree geometry relies on destructive measurements or expensive digital imagery requiring large facilities, preventing longitudinal studies, and constraining studies that require voluminous or large-scale observation (e.g., phenotypic plasticity, forest stands). Carefully acquiredphotography using hand-held digital cameras may provide sufficiently robust morphometric data to facilitate field-based studies of tree geometry. The goal of this project was to assess the accuracy and precision of measurements of tree geometry using digital photographs compared to direct physical measurements. We report here on a study that compared morphometric measurements acquired from readily acquired digital photographs with those acquired from direct physical measurements of a red maple, Acer rubrum. Our results are consistent with a prior test using a red maple (Acer rubrum) that hand-held digital photographs can yield highly useful measurements for the study of tree geometry with some distortions that can be readily accounted for. Morphometric analyses reveal incremental shifts in optimization of hydraulic efficiency and limb support from base to apex of the tree.

BEGINNING AT 9:30 A.M.

KIRKHOF CENTER 1104

In the Community, for the Community: A Systematic Review on Community Integration and Outcomes for Individuals with Autism

Presenters: Mia Gallagher, Isabel Holtrop, Emma LaMothe, Lauren Schrotenboer
Mentor: Dawn De Vries

This systematic review will explore the social and relational outcomes of individuals with autism participating in community integration. The influences of community integration on both this population and the general public will be examined.

KIRKHOF CENTER 2201

Evaluating the Success of Two Dfferent Monitoring Techniques for the Detection of Hemlock Wooly Adelgid

Presenter: Kathryn Geller
Mentor: Charlyn Partridge

Eastern hemlock (Tsuga canadensis) is a foundation species found throughout the cool, humid regions of North America. Currently, Eastern hemlocks are experiencing significant mortality due to the invasive insect, hemlock wooly adelgid (HWA) (Adelges tsuga). Current monitoring methods in Michigan include visual assessment of the lower branches for HWA ovisacs, however this method requires excessive time and resources while also being relatively unreliable. Other methods have been proposed as alternatives to ground visual assessment. One method used by the Canadian Forest Service (CFS) is ball sampling, which is the act of slingshotting a velcro-covered racquetball through hemlock stands to collect HWA material from the upper canopy. Another method is the collection of airborne environmental DNA (eDNA) for monitoring HWA. For my project I plan to explore the relative success of the ball sampling method when paired with genetic analysis compared to airborne eDNA monitoring. The presence of HWA will be assessed using quantitative real time PCR (qPCR). Sampling will be conducted in low infested areas, and in areas considered to have a high risk of being infested but where no HWA has been observed.

KIRKHOF CENTER 2266

Using Photoelicitation to Understand Mental Health and Coping Methods in College Students

Presenter: Jacqueline Belkin
Mentor: Babasola Fateye

We used photoelicitation in order to gain insights into the mental health and coping strategies of college students. Participants in our survey were asked to review and interpret 10 images collected from students in a previous photoelicitation study . The participants were then asked to rate the coping mechanisms pictured in each image on a scale from 1 to 10, where 1 signifies a negative coping strategy, 5 indicates a neutral approach, and 10 denotes a

positive coping strategy. We also asked several mental health professionals to provide their insights into the images and coping strategies. Responses were analyzed in order to determine the congruence between the interpretations of the students who provided the photos and those of the student respondents.

KIRKHOF CENTER 2270

Comparative Healthcare: Changing US Health Policy

Presenter: Georgia Barber
Mentor: Joel Stillerman

The United States healthcare system differs from any other system because of its unique health coverage that varies depending on the individual. In other developed countries, healthcare access has been deemed a human right, and insurance access and healthcare costs are equal and shared among citizens. The US has failed to create a healthcare system that values the life of the American rather than the monetary value that the healthcare sector can provide for the country. Countries with far less gross domestic product have more inclusive healthcare systems that provide equal access to residents. Additionally, the US has various healthcare disparities that plague various minority groups such as the transgender community and racial and ethnic groups. Thus, the purpose of this podcast is to understand health policy and to construct an implementation plan that would improve the healthcare system within the United States. To do so, different healthcare models will be described, US healthcare disparities will be explored, and potential solutions to the healthcare crisis will be suggested.

BEGINNING AT 10:00 A.M.

KIRKHOF CENTER 1104

Benefits of Horticulture for Muscle Degeneration

Presenters: Kate Reimer, Anna Schuller, Olivia Xue
Mentor: Dawn De Vries

This presentation will examine the current literature on the benefits of the therapeutic use of horticulture for patients with muscle degeneration. Therapeutic use of horticulture can be defined as using plants and plant-based activities for rehabilitation purposes. Patients with muscle degeneration would include older adults, those with birth defects, and orthopedic patients. This presentation focuses on the physical benefits of this intervention as well as ways to implement this in client care.

KIRKHOF CENTER 2201

Solutions to Wealth Inequality in the United State

Presenter: Katelyn Machuta
Mentor: Joel Stillerman

Wealth inequality, which refers to the unequal distribution of assets throughout a population, is a pervasive problem in the United States that has only worsened over time. Wealth inequality won't simply disappear on its own; policies must be implemented to reduce it. An equitable society necessitates a more even distribution of wealth throughout its population. The literature indicates that reducing wealth inequality requires policies that curb wealth concentration and help bolster the wealth of those at the bottom. The latter policies would also close the race and gender wealth gaps. I used data from multiple reports that analyzed the effectiveness of a proposed wealth tax and the expanded Child Tax Credit in curbing wealth inequality. My findings indicate that policies addressing wealth inequality from multiple angles can be effective in creating a more equitable society in the United States. It is only a matter of implementing these policies at a federal level, a major political undertaking, but a neccessary one.

KIRKHOF CENTER 2266

Exploring Identity through Literature: A Hybridity Analysis of Maame by Jessica Georg

Presenter: Amanda Anka
Mentor: Anthony Spencer

Jessica George's novel Maame explores the complexities of diasporic identity, particularly focusing on the protagonist Maddie's struggle to reconcile her Ghanaian heritage with her British upbringing. Through a thorough textual analysis, this paper examines how the concept of hybridity influences the representation of Ghanaian culture and identity within the narrative. The analysis dissects various themes such as cultural identity, language, family dynamics, societal expectations, and the interplay of hybridity as portrayed in Maddie's narrative. The paper employs discourse analysis to uncover the nuances of language use, societal norms, and power structures, shedding light on the construction and negotiation of identity within different contexts. Findings reveal the intricate negotiations of hybrid identity and cultural adaptation experienced by characters like Maddie, who exist within a 'third space' between Ghanaian and British cultures. The significance of cultural symbols and the negotiation of belonging further enrich the exploration of diasporic identity in the novel. Overall, Maame serves as a poignant portrayal of the complexities and challenges inherent in navigating multiple cultural landscapes and underscores the multifaceted nature of diasporic experiences.

BEGINNING AT 10:30 A.M.

KIRKHOF CENTER 1104

How does animal assisted therapy benefit veterans with PTSD

Presenters: Sara Hitchcock, Jessica Norton, Ciarra Salwa
Mentor: Dawn De Vries

We present the outcomes of our study of the different ways that animal-assisted therapy can reduce psychological and physical symptoms of veterans with Posttraumatic Stress Disorder. This is based on a literature review looking at how animal-assisted therapy benefits veterans.

KIRKHOF CENTER 1142

Consulting Project on Annis Water Resources Institute (AWRI) on Phyto/ZooPlankton

Presenters: Ian Bellgraph, Hayden Strabel
Mentor: John Gabrosek

Dr. Kevin Stychar of the AWRI collected data at the Long Island Sound that analyzed the presence of phytoplankton and zooplankton species seasonally across a two-year time period. As statistical consultants, we need to determine environmental/seasonal factors that could indicate differences in the species behavior. Another area of focus is whether each species engages in bet-hedging, a behavior characterized by certain environmental measures that increase chances of evolutionary fitness in stressful conditions.

KIRKHOF CENTER 2201

Recreational Angler Attitudes and Motivations: Winter Fishing in Drowned River Mouth Lakes

Presenter: Caden Shannon
Mentors: Amanda Buday, Carl Ruetz

Understanding the sociological factors at play is an important aspect of fisheries management. The objective of this research is to better understand the attitudes and motivations of recreational anglers fishing in drowned river mouth (DRM) lakes during winter. DRM lakes occur along the eastern shore of Lake Michigan and are lake-like habitats that connect tributaries to Lake Michigan. The winter fishery in these lakes is especially important because it allows anglers a more accessible opportunity for recreation and food acquisition that does not require expensive equipment (e.g., boat). In this study, we focused on four DRM lakes: Macatawa, Muskegon, Pentwater, and Pere Marquette. Anglers at each of these four lakes were asked a series of questions. Participants responded to Likert scale statements pertaining to their reasons for fishing (e.g., food acquisition) and importance of various aspects of fishing (e.g., being outdoors). We are currently in the process of data collection but anticipate this information will be an important first step in understanding angler motivations and attitudes associated with DRM lakes. Combining the sociological information we are collecting with existing ecological information should provide a useful tool to aid fisheries management in DRM lakes.

BEGINNING AT 11:00 A.M.

KIRKHOF CENTER 1142

Consulting Project on ESL Data

Presenters: Katie Braniff, Jung-Hye Hwang
Mentor: John Gabrosek

A statistical analysis on the impacts CKLA curriculum has on language and literacy development of English Second Language students. This research is done by a high school teacher assessing a method of teaching language and literacy to English Second Language (ESL) students. This method is called the Core Knowledge Language Arts (CKLA) curriculum. A number of tests are administered throughout the curriculum, scoring students on their skill level in phonics, fluency, spelling and vocabulary. Pre and post test data will be analyzed to determine if the curriculum is effective for English learners. The goal is to prove that this approach to teaching can be used in secondary education as well

BEGINNING AT 11:00 A.M.

KIRKHOF CENTER 1142

Consulting Project on ESL Data

Presenters: Katie Braniff, Jung-Hye Hwang
Mentor: John Gabrosek

A statistical analysis on the impacts CKLA curriculum has on language and literacy development of English Second Language students. This research is done by a high school teacher assessing a method of teaching language and literacy to English Second Language (ESL) students. This method is called the Core Knowledge Language Arts (CKLA) curriculum. A number of tests are administered throughout the curriculum, scoring students on their skill level in phonics, fluency, spelling and vocabulary. Pre and post test data will be analyzed to determine if the curriculum is effective for English learners. The goal is to prove that this approach to teaching can be used in secondary education as well

KIRKHOF CENTER 2201

Mental Health In America: Addressing the Crisis of Mental Health Service (In)accessibility

Presenter: Sam Fisher
Mentor: Joel Stillerman

In recent years, the number of Americans living with serious mental illness has increased dramatically. At the height of the COVID-19 pandemic, rates of depression and anxiety reached an all-time high. Yet Americans' access to comprehensive mental health care has not advanced to reach the increasing demand for services. This analysis aims to understand the barriers preventing Americans from accessing mental health services. These barriers are addressed as problems of accessibility and affordability of mental health services. An analysis of the current deficits of the health system in providing for the needs of those living with mental illness is conducted and possibilities for improving the accessibility of mental health services are proposed.

KIRKHOF CENTER 2266

Why So Tuff? Preliminary Data of an Ignimbirte From the Yellowstone Hotspot Track

Presenter: Jonathan DeSantiago
Mentor: Ginny Peterson

The mantle-sourced Yellowstone Hotspot has tracked through central Idaho, currently beneath Yellowstone National Park, since 14 million years ago. The track left behind several caldera-volcano super-eruptions, with associated ash-flow tuffs, a common explosive volcanic rock. Many of these tuffs have been mapped, dated, and described, however, some tuffs have been overlooked. One such case is that of the Undifferentiated Tuff of Grouse Idaho.

By characterizing the Undifferentiated Tuff to place it within the volcanic sequence of the Yellowstone hotspot, the progression of volcanism can be better understood. This characterization could extend the known mapped units of the Bruneau-Jabridge caldera or fill in the extent of a Picabo caldera ash-flow-tuff. In the field, the Undifferentiated Tuff is described as having a lithoidal slope-forming zone that is mostly covered and a basal vitrophyre with rounded small cliff-forming outcrops. Using microscopy of the basal vitrophyre, is easily seen to have a main glassy matrix with many lithics and intermediate composition. It also contains inclusions of separate glass fragments containing perlite textures within them. Geochemical data will suggest that this tuff either belongs to other surrounding tuff units or if it is a new member itself.

KIRKHOF CENTER 2270

Communication In The Classroom- African Students In The U.S Midwestern Universities.

Presenter: Ruth Yeboah
Mentor: Anthony Spencer

More African students are attending US universities, particularly in areas where they previously have not formed large populations such as the Midwest. As the enrollment of African students in the U.S continues to rise, it becomes ever more important to examine the factors which help those students succeed. I

n this study, I want to know how African students navigate a new environment. How well do African students integrate into US university life? In this project, I am interviewing 10-15 African students at a Midwestern American University to better understand their adaptation experience and find out which factors are most important in reating a positive learning and living experience.

Preliminary findings reveal that African students' experiences do not always align with their expectations, which calls for adjustment to difficulties upon arrival in the United States. Themes which have begun to emerge include intercultural interactions with professors and classmates, cultural issues like the concepts of space and time in US academic life, and structural issues such as the quality of orientation on arrival, support once classes have begun,etc. Findings from this study will have an important impact on international education, intercultural interactions, and student support in general.

BEGINNING AT 11:30 A.M.

KIRKHOF CENTER 1142

Consulting Project - Dog Trainer Study

Presenters: Garrett Hamacher, Parker Kuchulan
Mentor: John Gabrosek

Have you ever wondered why some dog trainers tend to use aversive methods to train dogs more than others? In this study, we explore the psychological/sociological predictors of whether a dog trainer will use aversive training methods

such as negative reinforcement and positive punishment, and what exactly those predictors could be. A comprehensive survey comprising over 300 questions was administered to 145 licensed dog trainers. The survey explored aspects such as religious beliefs, parenting styles, and other psychological/sociological characteristics that may influence the preference for aversive training methods. Our findings aim to shed light on the underlying factors shaping the approach of dog trainers in their training practices

KIRKHOF CENTER 2270

Learning to Learn All Over Again: An International Student Autoethnography

Presenter: Md Sabbir Hossain
Mentor: Anthony Spencer

Everyday tasks may seem unimportant and meaningless; however, when you are from another country, simple tasks can become giant cultural hurdles. Figuring out how to cross the street, make bank transactions, and other simple chores may not be quite so simple. The most mundane errands can create frustration, isolation, and a deep sense of fear for international students who often must re-learn routine procedures. The goal of this project is to analyze how simple tasks can b come barriers to everyday life for international students. In this study, I combine autoethnography with in-depth interviews to better understand and articulate how international students confront and use sense-making skills to overcome small yet important cultural barriers at a Midwest university in the US.

BEGINNING AT 12:00 P.M.

KIRKHOF CENTER 1142

NextEd Consulting Project

Presenters: Nicole DeVries, Naod Fesseha Teklu
Mentor: John Gabrosek

Analysis of NextEd-Colab K-12 Connect Tutoring Effectiveness on Student Learning and Classroom Confidence

Undergraduate students Nicole DeVries and Naod Teklu of the Department of Statistics at Grand Valley have been analyzing self-efficacy assessments from NextEd Co-Lab K-12 Connect Tutoring. The K-12 Connect program specializes in 12 week in-school tutoring sessions that are focused on literacy, math, science, and many content subjects. In this study, Naod and Nicole compare the scores of students who are being tutored for literacy. Their roles are to clean and organize the data from recent 12-week sessions from K-12 and analyze the difference between scores for the pre-test and post-test. In addition, they seek to advise NextEd Co-Lab about how they can change their assessment structure to gain a deeper understanding of student progress.

KIRKHOF CENTER 2266

The Alarm runs out before the Hour.

Presenter: Darby Williams
Mentor: Drew Pettinga

"Our body is a well-set clock, which keeps good time, but if it is too much or indiscreetly tampered with, the alarm runs out before the hour." -Joseph Hall Our time is fragile, just as we are fragile. We are locked onto a ticking clock, without any idea as to when it will stop. Where every life begins, there is an end, but no one knows when the end will be or how it will happen. It's a terrifying concept to think about, the kind that leaves your stomach full of anxiety and dread. Did I do everything in my Bucket List? Will I be leaving a good impression when my time is up? When did I last tell my family I loved them? When did I last thank my friends for always being there? Have I done enough? Have I lived enough? Maybe. I don't know.

BEGINNING AT 12:30 P.M.

KIRKHOF CENTER 2201

“Home” Is Changing - Vietnamese Locals Voice on the Changing with the Influx of Digital Nomads in Vietnam

Presenter: Y Hong Nhu Nguyen
Mentor: Anthony Spencer

The Digital Nomad (DN) was not created by the COVID-19 Pandemic; however, the worldwide health crisis did make the term nearly a household phrase in the West. DNs work remotely while traveling across borders, often staying in countries for short or long periods. Digital nomads tend to flock to countries with tropical climates and an affordable cost of living, primarily nations in Asia and Latin America. These destinations allow DNs to create a home with just their laptop and smartphone. However, as they travel, their presence leaves social impact on people in those host countries who do not have mobile jobs, earn less money, and must negotiate new socio-linguistic spaces as their lives are altered by nomads. In this project I focus on my home country of Vietnam to understand how “home” is changing for the Vietnamese who are impacted by DNs. To collect data, I am using Zoom to conduct in-depth interviews with Vietnamese people who have interactions with DNs in Vietnam. This project explores the way(s) Vietnamese people view the intercultural negotiations between the locals and digital nomads. Some of the prominent themes to be explore include language usage, pricing, cultural practices, and other salient cultural topics.

BEGINNING AT 1:00 P.M.

KIRKHOF CENTER 2201

Between the Devil and the Deep Blue Sea: Blending Genre and Gender

Presenter: Alyse Gastmeier
Mentor: Oindrila Mukherjee

Transgender people are often made to feel like outsiders in their communities as “others” who have failed to fall in line with rigid gender roles, even if they can meet the nigh-impossible standards imposed on them. This memoir is centered on my personal experience with that “othering”: finding myself caught somewhere between boundaries that are often enforced with cruelty. As I constructed this piece over the course of several weeks, finding material for the story I wanted to tell, I began to see deeper connections between the varied mediums and genres that I used to create it and the subject matter itself. The piece is tied together by a water motif, spanning saltwater and freshwater. Much like genre and gender identity, water morphs and is capable of taking on countless shapes. The boundaries between genres are not static; rather, they shift and overlap, changing with time and culture, and when they are present, they can still work in tandem to create a textured narrative, when one genre alone cannot fully convey an experience. In order to fit somewhere, water can bend itself any way it needs to. This memoir details when I’ve had to do the same.

KIRKHOF CENTER 2270

United States vs. Italy Healthcare System

Presenter: Anna Bisonet
Mentor: Chad Sutliffe

Italy and the United States have distinct healthcare systems, each with its own merits and challenges. Italy adopts a universal healthcare model, ensuring access for all citizens, while the U.S. relies on a predominantly private healthcare system, where individuals often obtain coverage through employersponsored private insurance plans. The U.S. is recognized for its technological advancements but grapples with high care costs, limited access, and financial hardships for some. Conversely, Italy is known for its cost-effective healthcare and positive health outcomes. Despite differences in legal, philosophical, and financial aspects, both countries can draw lessons from each other. The fundamental objective of any healthcare system is to provide accessible, affordable, and high-quality care to all citizens. Italy achieves this through universal coverage, whereas the U.S. navigates challenges in balancing accessibility, cost control, and private sector involvement. The pursuit of healthcare improvements remains ongoing in both nations, aiming to enhance the health and well-being of their respective populations. This project focuses on comparing Italy and the U.S., emphasizing aspects like care quality, cost, life expectancy, and health outcomes within their healthcare models.

BEGINNING AT 3:00 P.M.

KIRKHOF CENTER 1104

MasterChef Contestant to Social Media Influencer: Do Men and Women Differ in Pursuing Prestige?

Presenter: Jada Thomas
Mentor: Robert Deaner

The male show-off hypothesis claims that men are more likely than women to show off their abilities and publicly compete. However, the male show-off hypothesis has yet to be tested in a domain where both men and women are consistently involved, such as cooking. To examine showing off and cooking, we assessed the social media

behavior of MasterChef reality program contestants both in the U.S. andAustralia. We focused on 98 contestants from MasterChef U.S. (m = 52 & f = 46) and 107 contestantsfrom MasterChef Australia (m = 45 & f = 62). For each contestant, we examined the social media content they produced on several popular platforms upon the conclusion of their season. Although we coded several measures, our primary measure was Instagram followers. Contrary to the male show-off hypothesis, in both the U.S. and Australia, the number of followers did not differ significantly between male and female contestants. This result suggests that the male show-off hypothesis may not be valid in all domains.

KIRKHOF CENTER 1142

A Statistical Consulting Experience: Comparisons Between GVSU and National I.T. Feedback

Presenters: Summer Statema, Breanna Stewart
Mentor: John Gabrosek

Technology is becoming an increasingly present facet of everyday life. This is especially true in the educational setting. As universities turn further from physical books and more towards technology, feedback from users becomes progressively more crucial. This presentation will be a discussion of our experiences as statistical consultants in tackling an important comparison of a very current topic - technology usage from the perspective of university faculty and students nationwide and at GVSU.

KIRKHOF CENTER 2201

The Experiences of Women in Homes for Unmarried Mothers, 1945-1985

Presenter: Hannah McBride
Mentor: Nora Salas

This research examines the experience of unmarried mothers in the years after World War II. Many unmarried mothers went to maternity homes due to ideas of societal guilt and shame. Unmarried mothers, their parents, staff in the homes, and professionals associated with the homes were not exempt from the societal pressure. This research will focus on the Evangeline/Booth Home which was located in Grand Rapids, Michigan. The Evangeline/Booth Home focused on rehabilitating the women through religion, controlling her social activities, and enforcing the neo-traditional views that emerged in the post-war years. Maternity homes provided many services for women; however, in retrospect, these services are viewed as coercive and harmful by many of the residents.

BEGINNING AT 3:30 P.M.

KIRKHOF CENTER 1142

SLA Tutoring Center Consulting Project

Presenters: Jayna Clark, Arleth Reyes Apolonio
Mentor: John Gabrosek

GVSU Structured Learning Assistance Statistical Analysis

Structured Learning Assistance (SLA) is a form of supplemental instruction coordinated by the Tutoring and Reading Center at Grand Valley. This program implants a peer instructor into historically difficult courses to assist students in both content as well as improvement of overall academic skills. In coordination with Keigh-Cee Bell, the GVSU Tutoring center director, we analyzed data from the Fall 2023 semester to assess the efficacy of the SLA program. Specifically, we looked at retention rates of SLA students in comparison to non-SLA students as well as focusing on those who need more assistance when coming to a four year college: first generation students and first time at any college students. We will try to determine where students need more help and what type of students would be interested in the program but might not know it exists.

KIRKHOF CENTER 2266

The Split Lives Created by Divorce: Impact on Child Well-being

Presenter: Arieal Jackson
Mentor: Anna Hammersmith

Prior research has documented the impact of divorce on children's social and emotional development. Current research indicates that marital conflict can be externalized and internalized by the child. This project will analyze children's socioemotional outcomes compared to children whose parents are still together. This study will also examine the role various family structures play in child socioemotional outcomes after experiencing a divorce and in what ways different family structures (e.g., half or step siblings) can amplify the consequences of divorce. Moreover, this research will analyze the key differences for boys relative to girls who experience a divorce. Secondary quantitative data analysis of the National Survey of America's Families (2002) and interviews will be used to explore these themes, and add to the research on the effects of divorce on young children. Findings from this study have the potential to inform programs and interventions geared to help children adjust to parental divorce. This study will analyze child-parent relationships, the split life (i.e., joint custody) and the various family structures that become non-significant during a divorce (i.e., half siblings, biological siblings and step siblings).

BEGINNING AT 4:00 P.M.

KIRKHOF CENTER 1142

Self-Advocate Guest Presenter Series: Exploring Perceptions of Disability

Presenter: Jayden Schepflin
Mentor: John Gabrosek

In this study, we examined the impact of implementing a Self-Advocate Presenter Series featuring individuals with disabilities on attendees' perceptions of disability. The participants in this study were students enrolled in one of eight special education courses at one of two medium-sized public universities in the midwestern region of the United States. Students completed the "Perceptions of Disability Scale" by McKenney & Long (2021) before and after attending three presentations across the Fall 2023 semester. Using this scale, our study examines whether there

was a change in attitudes toward people with disabilities, specifically in regard to sympathy, empathy, and advocacy. We showcase the robust consistency in measuring sympathy and advocacy, offering profound insights into the classroom dynamics. However, the empathy subscale introduces a detailed aspect, adding an element of intrigue to our exploration. Join us in this brief yet dynamic presentation as we navigate through the wide spectof perceptions, offering a snapshot into the evolving attitudes within the education realm.

Recorded Oral Presentation

Ongoing

VIRTUAL VIRTUAL 005

Interactive Historical Redlining Mapping Analysis

Presenter: Lauryn Davis
Mentors: Bradford Dykes, Tamara Shreiner

Interactive mapping is a key component in adequately representing historical trends and segmentation. This research used a website development platform called, “Shiny for R studio” to create a comprehensive analysis of historical redlining data. Traditional data-mining practices aligning with the knowledge discovery process were adhered to. Furthermore, the primary component of the website contains layered shape files that correspond to the Home Owners' Loan Corporation (HOLC) grades given within communities throughout the 1930s. Economic and demographic segmentations were compared in conjunction with the HOLC grades. Statistical analysis and data visualization were performed to aid in providing noteworthy conclusions relating to this subject matter. This work will provide a foundation for where society is now in consideration of the potential impact the redlining policies/practices had within communities.

VIRTUAL VIRTUAL 006

Developing LGBTQ- Centered Teacher Training Programs in K-12 Public Schools

Presenter: Kali Blick
Mentor: Leifa Mayers

LGBTQ+ youth are at higher risk of depression, anxiety, and suicide compared to their cisgender and heterosexual peers. Facing discrimination and harassment in hostile and exclusionary school environments can exacerbate mental health struggles even more. Research indicates the need to better equip and educate K-12 teachers and staff on the struggles of LGBTQ+ youth and the importance of the roles they play in diversity, equity, and inclusion of LGBTQ+ youth in their schools. This project uses discourse analysis with a critical queer and trans theoretical framework to understand K-12 school policies and practices. Preliminary findings suggest the lack of DEI programs, specifically DEI programs covering topics related to LGBTQ+ identities, the lack of protective policies for LGBTQ+ youth, and the lack of guidance for school leaders around implementing policies meant to protect LGBTQ+ youth against bullying and harassment. Analysis of the data will inform the implementation of a training workshop aimed at offering more inclusive training and guidance around the LGBTQ+ community; this workshop is intended to better equip K-12 school leaders with the knowledge to best support LGBTQ+ youth and intervene in the persistence of hostile school environments.

VIRTUAL VIRTUAL 007

Graduate Student Experience in an Online Curriculum: An Evaluation using the Community of Inquiry Framework

Presenter: La'Tisa Wible
Mentor: Marie VanderKooi

As the world of healthcare is ever-changing, so is the atmosphere of learning for graduate nurses. Innovation and technology use for collegiate education have grown significantly since the COVID-19 pandemic, and online curricula for Graduate Students have become more popular. Grand Valley State University's College of Nursing (KCON) recognizes and acknowledges the growing need for more options of online curricula and courses to accommodate students looking for expansion as graduate-prepared nurses in healthcare. KCON redesigned the Graduate program's delivery methods from traditional inperson education to hybrid, and soon after from hybrid to completely online (apart from a few days for on-campus simulations and labs). Using the Community of Inquiry framework as part of a quality improvement initiative, an evidence-based survey will be used to collect information from KCON Graduate nursing students from the Class of 2023 about their opinions and experiences of the newly redesigned curriculum. Future graduates of 2024 and 2025 will also be asked to complete the same questionnaire for KCON to evaluate if the new curriculum meets the needs of today's graduate nurses and program expectations. These results will help continue to guide the future design of the Graduate Nursing curriculum at Grand Valley State University.

VIRTUAL VIRTUAL 008

First-Person Narratives of Reproductive Health Encounters

Presenter: Grace Scholten
Mentor: Leifa Mayers

It is not uncommon for women struggling with reproductive disease to have adverse experiences with healthcare providers when seeking diagnosis or treatment. This research project applies discourse analysis to first-person narratives about people's encounters with health care professionals in their attempts to receive a diagnosis or treatment. Data was collected through first-person narratives shared on various social media platforms. Preliminary findings include dismissive or condescending behaviors from a doctor, incorrect diagnosis or treatment from a doctor, and exceptional feelings of distress from patients. These findings may reflect insufficient standards of care for people regarding reproductive and menstrual health care, which is consistent with the small amount of literature that exists on the subject. This data could potentially point to a larger issue within the healthcare system, which is a lack of understanding and sympathy for women's pain.

In-Person Session

BEGINNING AT 3:00 P.M.

KIRKHOF CENTER 2270

Marginalization & the Media: Using Research to Create Inclusive Spaces

Presenters: Amber Beaudry, Calvin Hatcher, Y Hong Nhu Nguyen, Asante Wilson
Mentor: Anthony Spencer

Amber Beaudry

4.2 million youth in the US are homeless and 700,000 are unaccompanied, meaning they don't have a parent or guardian to care for them. This project focuses on how unhoused teenagers are portrayed in popular culture. In this project the author conducted a content analysis to unearth the tropes television producers employ to create stereotypical characters which reify harmful generalizations and can make life more difficult for people who face housing insecurity or are recovering from it. The author analyzed how the popular television series One Tree Hill portrayed a homeless teen, creating harmful images of a young person who steals, cannot perform well in school, and needs the charity of others to survive. These stereotypes are detrimental because they create a sense of shame for young people who face housing insecurity. The study illustrates how small acts of empathy and kindness can create moments of understanding for the character and the people who watch the show, possibly removing a damaging stigma for many teens.

Calvin Hatcher

In recent years, reality television has become dominant in shaping popular culture and influencing societal perceptions of "reality". However, beneath the glitz and glamor of these shows lies a concerning trend of misrepresentation and perpetuation of harmful stereotypes of the LGBTQIA+ community. These portrayals often fall short when it comes to accurately representing the diverse experiences of the group; making the members seem homogenous to easily create plotlines. These shows tend to perpetuate stereotypes, reinforce biases, and exploit LGBTQ+ people for ratings. This project is a content analysis of the popular reality show The Real Housewives of Atlanta which does center the experiences of Black women but falls short in its portrayal of their best accessory, gay men. The themes which emerged in this analysis illustrate how the producers portray gay men as feminine and drama queens because these stereotypes are convenient and non-threating to audience member; however, if producers take accountability and confront these stereotypes, reality show can provide learning moments for the cast and audience. These programs can use their cultural influence to help create meaningful social change.

Y Hong Nhu Nguyen

The Ainu are the first peoples to inhabit the islands we now know as Japan. The Ainu people have suffered discrimination, economic marginalization, and perhaps worst of all efforts of complete assimilation. In 2019, the Japanese government released the Ainu Policy Promotion Act with the aim to reclaim and protect the Ainu heritage. The message about the law has not been widely disseminated and many Japanese people have not even heard of the protections. This project explores how Japanese citizens living in the US discuss and understand the efforts to protect the Ainu people. The researcher conducted 8 in-depth interviews with Japanese nationals from different prefectures in Japan, to understand the absence of dialogue about the policy. All 8 participants expressed interest in the project and learning more about the indigenous people of their own country. Shedding light on the under-studied Ainu people can help other indigenous/first peoples gain media attention which would benefit not only the native populations but also enrich the larger culture in which they live.

Asante Wilson

This project uses the agenda-setting theory to analyze how news media outlets depict gun owners. The analysis delves into the underrepresentation of gun owners who are black, LGBTQIA+, and liberal, highlighting how media portrayal perpetuates stereotypes, influencing conversations on gun control, gun rights, and gun violence. The study aims to offer a fresh perspective on the complex interplay between media narratives and the broader discourse surrounding firearms in the United States. This study allows us to understand not only the complexities of gun ownership but reaffirms how CIS straight White people (usually male) are centered in dialogue of important issues. If news outlets seek out diversity of people regarding gun ownership and other polemic issues this could help to reduce divisions and create dialogue on divisive political topics.

In-Person Extended Session

BEGINNING AT 11:00 A.M.

KIRKHOF CENTER 2263

Stimulation of Retinal Pigment Epithelium with an α7 nAChR Agonist Leads to Neurogenesis in Cultured Pig Retina

Presenters: Cydney Eastman, Taylor Saber, Eliot Van Pelt
Mentor: David Linn

Previous work has shown that activation of a specific nicotinic acetylcholine receptor (nAChR) on retinal ganglion cells (RGCs) protects from the damage associated with glaucoma. More recent work has shown that in addition to this neuroprotective effect, activation of the alpha7 nAChR can lead to the generation of new adult retinal cells via a multi-cellular pathway. Specifically, activation of alpha7 nAChRs (with PNU282987) on retinal pigment epithelial (RPE) cells induces the release of substances that cause retinal Muller glia (MG) to re-enter the cell cycle and produce new retinal cells, including RGCs. One such study exposed an RPE cell line to PNU-282987 and then injected the supernatant from that culture into the eye of an adult rodent. The neurogenesis of retinal cells was confirmed by several techniques. We are attempting to replicate those studies using primary culture of adult pig RPE and adult pig retina. Basically, we used 4 different experimental conditions and counted cells at the end (ImageJ). Condition A: Retinal cells cultured for 5 days without any intervention. B: Retinal cells exposed to untreated RPE. C: Retinal cells exposed to RPE treated with a low dose of PNU-282987. D: Retinal cells exposed to RPE treated with a high dose of alpha7 activator. We observed a dose-dependent increase in retinal cells exposed to supernatant from RPE stimulated with PNU-282987 confirming the validity of this approach using nonrodent mammalian tissue.

BEGINNING AT 12:30 P.M.

KIRKHOF CENTER 2263

Mathematics Presentations

Presenters: Alaina Hogan, Rowan Kennedy, Marshall Nicholson, Mallory Price, Bridget Rozema, Justin Sciullo, Nicholas Simmons, Maisie Smith, Ethan Woudwyk, Sarah Zaske
Mentors: Feryal Alayont, Lora Bailey, Lauren Keough

12:40-1:00 Calculating Differences between Dancers and Non-Dancers
Alaina Hogan
Mentor: Lora Bailey

In this project, we study the physical, visual, and stylistic characteristics of trained and untrained dancing individuals. We determine these characteristics and prospective differences by acquiring data through motion capture equipment and analyzing it using singular value decomposition. We aim to answer the question: what mathematical differences in movement and artistic ability are there between dancers and non-dancers?

1:00-1:20 Edge Covers of Unions of Path and Cycle Graphs
Bridget Rozema and Maisie Smith
Mentor: Feryal Alayont

We can represent relations among discrete objects using a visual graph with dots (vertices) and lines connecting the dots (edges). A line between two dots indicates a relation between those two objects. An edge cover of a graph G is a subset of the edges where every vertex is the endpoint of at least one edge in the subset. In this project, we studied the number of sequences formed by counting the edge covers in a graph family. Path and cycle graphs generate the famous number sequences Fibonacci and Lucas numbers, respectively. We will report on the properties of the number sequences resulting from graphs obtained by taking the union of path and cycle graphs with one or more common vertices.

1:20-1:40 Edge Covers of Joined Cycle Graphs
Marshall Nicholson, Ethan Woudwyk
Mentor: Feryal Alayont

A graph is a mathematical representation of binary relations between discrete objects. An edge cover of a graph is a selection of these relations where each object is part of at least one relation. We represent graphs using dots (representing objects) and lines (representing relations). Our project investigated counting edge covers of a specific type of graph consisting of iterations of a six dot graph arranged in a cycle where each dot is connected to two neighbor dots and where two neighboring cycles share two common dots. We will present a matrix model to count the edge covers of these chains of cycle graphs.

1:40-2:00 Edge Covers of Modified Path and Cycle Graphs
Rowan Kennedy, Mallory Price
Mentor: Feryal Alayont

A graph is a mathematical structure visually represented with vertices (dots) and edges (lines) that connect pairs of vertices. An edge cover of a graph is a subset of the graph's edges chosen so that each vertex is an endpoint of at least one edge in this subset. In this project, we studied the sequences formed by counting the total number of edge covers in a graph family. It is known that the edge cover totals of certain graph families, such as the path and cycle

graphs, give rise to known sequences, the Fibonacci and Lucas numbers, respectively. This allows us to obtain new combinatorial interpretations of known sequences or to generate new sequences from edge cover totals. In this presentation, we will report on our results on the edge cover sequences for graphs obtained by attaching 3-vertex path and cycle graphs.

2:00-2:20 Distinguishing Index of Mycielskian Graphs
Rowan Kennedy, Mallory Price, Nicholas Simmons, Sarah Zaske
Mentor: Lauren Keough

The distinguishing number and distinguishing index give a measure of the symmetry of a graph. We define a distinguishing vertex coloring to be a coloring of the vertices of a graph G such that no nontrivial automorphism preserves the vertex coloring. The distinguishing number, Dist(G), is the smallest number of colors possible for which there is a distinguishing coloring. Similarly, a distinguishing edge coloring is a coloring of the edges of G such that no non-trivial automorphism preserves the edge coloring, and the distinguishing index, Dist'(G), is the smallest number of colors needed for a distinguishing edge coloring. The Mycielskian of a graph G, denoted mu(G), is an extension of G introduced by Mycielski in 1955. In 2022 Boutin, Cockburn, Keough, Loeb, Perry, and Rombach showed that for graphs on at least 3 vertices Dist(μ(G)) ≤ Dist(G) and a similar result for generalized Mycielskians. We prove Dist'(μ(G)) ≤ Dist'(G) , finishing a conjecture of Alikhani and Soltani, as well as prove analogous results about generalized Mycielskian graphs.

2:20-2:40 An Analysis of Grand Valley State University Using Network Theory
Justin Sciullo
Mentor: Lora Bailey

We applied concepts from network theory to analyze Grand Valley State University's Allendale campus. In particular, we investigated the shortest path between campus buildings. We created a weighted graph of the sidewalks and buildings of GVSU, and created a program for students to use to find the shortest path between any two buildings on campus. Through additional analysis using NetworkX and Python we explored other questions such as where the center of campus is located, and what is the most important sidewalk.

BEGINNING AT 3:00 P.M.

KIRKHOF CENTER 2263

Psychology Department Awards Ceremony and Research Symposium

Presenters: Lauryn Babb, Lauren Behrenwald, Brooke Campbell, Elias Ghazal, Abigail Graffenius, Mya Hanna, GraceAna Hoorn, Joshua Kopich, Erin Korte, Amber Luckett, Brianna Mucciante, Emily Murray, Destinee Partain, Zoe Schultz, Jada Thomas, Samantha Walquist, Elizabeth Wehner Mentors: Brian Bowdle, Kristy Dean, Robert Deaner, Amanda Dillard, Gwenden Dueker, Mario Fific, Luke Galen, Mary Russa, Christine Smith

Psychology Department Student Awards Ceremony, 3-3:20pm

Presentation #1, 3:20-3:35pm: MasterChef Contestant to Social Media Influencer: Do Men and Women Differ in Pursuing Prestige?

Presenter: Jada Thomas
Mentor: Robert Deaner

Abstract: The male show-off hypothesis claims that men are more likely than women to show off their abilities and publicly compete. However, the male show-off hypothesis has yet to be tested in a domain where both men and women are consistently involved, such as cooking. To examine showing off and cooking, we assessed the social media behavior of MasterChef reality program contestants both in the U.S. and Australia. We focused on 98 contestants from MasterChef U.S. (m = 52 & f = 46) and 107 contestants from MasterChef Australia (m = 45 & f = 62). For each contestant, we examined the social media content they produced on several popular platforms upon the conclusion of their season. Although we coded several measures, our primary measure was Instagram followers. Contrary to the male show-off hypothesis, in both the U.S. and Australia, the number of followers did not differ significantly between male and female contestants. This result suggests that the male show-off hypothesis may not be valid in all domains.

Presentation #2, 3:35-3:50pm: The Impact of Social Exclusion on Conspiracy Belief Formation and Reality Construction

Presenter: Destinee Partain
Mentor: Kristy K. Dean

Abstract: Social exclusion fosters conspiratorial beliefs although the mechanisms at play are still unknown. Prior research suggests that excluded people join conspiratorial groups as a way to regain both acceptance and a level of control over their reality (van der Wal et al., 2018). The current study aims to replicate these results, while also examining the role of other basic needs (e.g., self-esteem, meaning in life, physical safety) in fueling conspiratorial beliefs. Additionally, the study aims to investigate how beliefs on reality (spiritual vs. scientific) act as a type of mediator potentially fueling conspiratorial thinking. To study this phenomenon, approximately 250 participants will experience either exclusion or inclusion in a workplace scenario. We will then measure threat to basic needs, belief in conspiracies, thinking styles (analytic vs. intuitive), and views on reality (scientific vs. spiritual). We expect that those who feel excluded will report higher threats to basic needs, stronger conspiratorial beliefs, and a preference for spiritual over scientific views on reality, compared to those who feel accepted. If our hypotheses are supported, the underlying mechanisms of how conspiracy ideas are formed and maintained will be further understood; allowing for more effective preventative measures and deradicalization techniques.

Presentation #3, 3:50-4:05pm: Testing the "natural-is-better bias for sunscreen

Presenter: Brooke Campbell
Mentor: Amanda Dillard

Abstract: This study tested the “natural-is-better bias” for sunscreen in college students. The goal of this experiment was to determine if people had different emotions and beliefs about a sunscreen when it was labeled natural vs synthetic. The participants in this study were randomly assigned to one of two

conditions. In one condition, they were told that the sunscreen they would be using was synthetic or made from ingredients not found in nature. In the other condition, participants were told that the sunscreen they were using was natural or made from ingredients found in nature. All participants were asked to use it under a fake sunlamp for a period of 7 minutes. Before and after using the sunscreen, participants' emotions were measured. Following using the sunscreen, participants were asked to rate their attitude toward the sunscreen as well as rate its safety and effectiveness. Results indicated that compared to those who believed they used a synthetic sunscreen, those who believed they used a natural sunscreen had a more positive attitude toward the sunscreen. Compared to those in the synthetic condition, those in the natural condition applied more of the sunscreen prior to using it under the sunlamp.

Presentation #4, 4:05-4:20pm: Authentic Dissent is Superior to a Devil's Advocate in Inspiring Divergent Thinking

Presenters: GraceAna Hoorn (co-presenter), Samantha Walquist (co-presenter), Lauren Behrenwald (coauthor), & Emily Murray (co-author).
Mentor: Christine M. Smith

Abstract: Although the presence of minority dissent within groups is associated with multiple benefits (e.g., divergent thinking, more robust examination issues), sources of dissent are perceived less positively than other group members, perhaps because they are construed as members of the outgroup. This has prompted the suggestion that dissent be introduced by way of a devil's advocate, thereby allowing the benefits of dissent to be reaped without any cost. We examined the cognitive processes of those exposed to majority influence, authentic minority influence and an assigned devil's advocate arguing a minority point of view. Our results suggest that authentic sources of dissent are more effective than devil's advocates in inspiring divergent thinking. However, despite their arguments being identical, authentic sources of minority influence compared less favorably to the majority than did those who were assigned the role of devil's advocate within their group along a variety of dimensions.

Presentation #5, 4:30-4:45pm: What Do Campus Police Officers Think About Their Role in Supporting Student Mental Health?

Presenters: Zoe Schultz, Abigail Graffenius, & Amber Luckett
Mentor: Kristy K. Dean

Abstract: Recognizing the role law enforcement officials have played in dealing with mental health issues across the nation, this study examined how campus police officers view their roles and responsibilities when responding to calls of service that include mental health concerns. Semi-structured interviews were conducted with 10 law enforcement officials from a midwestern university campus. Interviews asked about mental health training, the steps they take during a mental health call, how they distinguish criminal concerns and mental health issues, and who they believe should be responsible for responding to these calls. Interviews were transcribed and then coded and analyzed using MAXQDA. Preliminary results show that when interacting with students, officers utilize a direct line of questioning to help discern mental health concerns vs crises. Additionally, when asked who should be responsible for mental healthrelated calls, many officers recognized that within our society citizens call the police for most things. Therefore, police first responders bear some responsibility for addressing students' mental health crises, and report confidence in the skills their training provided. This research furthers our understanding of policing.

and mental health concerns in both a university context and in general.

Presentation #6, 4:45-5:00pm: Investigating predictors of neglect and termination of parental rights in local families

Presenters: Zoe Schultz, Erin Korte, & Brooke Campbell
Mentor: Mary Bower-Russa & Gwenden Dueker

Abstract: The Competency to Parent Project aims to understand how various parent, child, and family factors impact a parent's ability to effectively care for their child(ren). Archival Child Protective Services (CPS) family court case filings from a southwest Michigan county were analyzed and information relating to why CPS was investigating the family situation and the eventual court outcomes of the case were coded. Preliminary analyses aimed to discover what factors were related to the presence of physical neglect in the home, what factors predicted the court's decisions to terminate parental rights and whether including a "family churn" score (an attempt to describe the level of chaos in the family system) would improve prediction of court outcomes. Parent substance abuse and mental illness both positively predicted the presence of neglect in the home. Parent substance abuse, current incarceration, a child having been temporarily removed from parent custody and family economic instability were factors associated with an increased risk of losing parental rights, while the presence of emotional abuse in the home was associated with a decreased likelihood of termination. The family churn score did not predict court outcomes. This study explored the process surrounding local decisions about the termination of parental rights.

Presentation #7, 5:00-5:15pm: Religious Framing, Moral Foundations, and Identity: A Replication and Extension

Presenter: Brianna Mucciante
Mentor: Luke Galen

Abstract: Religiosity is positively associated with moral self-image enhancement. However, two previous pre-registered studies identified a framing effect such that initial completion of general religious measures resulted in lower moral self-image and binding morality compared to when the moral measures were administered first. This study attempts to replicate this effect with measures featuring differing religious content. Participants were assigned to receive either conservative religion first (followed by moral measures), liberal religion first, or the moral measures first. ANOVAs did not reveal an effect of type of religious measure on subsequent moral responding. However, exploratory analyses indicated a framing effect such that those first completing moral measures reported lower certainty of God's existence and greater atheist identification compared to those completing religious items first. Although not specifically hypothesized, this is similar to the previous pre-registered effect in that, despite a positive association between the two constructs, those completing moral measures subsequently report lower levels of religiosity. This may represent a "contrast effect" such that one set of material induces the motivation to respond in the opposite direction on the other. Although modest in size, this effect suggests that even reporting of self-identity (i.e., as religious or atheist) can be malleable.

Presentation #8, 5:15-5:30pm: Exploring the Causal Relationship Between Lack of Control in One's Life and Conspiratorial Beliefs

Presenters: Elias Ghazal, Lauryn Babb, Elizabeth Wehner, Mya Hanna, & Joshua Kopich
Mentors: Mario Fific & Brian Bowdle

Abstract: Exploring the individual tendency towards embracing conspiratorial beliefs presents a considerable challenge for researchers, frequently uncovering weak and inconsistent correlations with factors such as personality traits, perception of cognitive processes, decision-making capabilities, and sensory sensitivity. A major limitation of these research is its reliance on correlational, self-report measures. To address this gap, our study introduces an experimental approach, the "Broken Fridge" task, designed to place participants in a scenario where they must attempt to control the temperature of a refrigerator. This setting uniquely positions participants to experience a loss of control, thereby allowing for a direct assessment of the locus of control. Our methodology aims to provide more detailed insights into the effect of individual's locus of control and their propensity towards conspiratorial beliefs. This experimental procedure not only circumvents the limitations of traditional self-report measures but also offers a novel perspective on the intricate dynamics underlying the formation of conspiratorial thinking. Through this approach, our study aims to illuminate the detailed interplay between psychological control and the endorsement of conspiracy theories, offering a more robust understanding of the factors that contribute to conspiratorial beliefs.

Virtual Extended Session

BEGINNING AT 10:00 A.M.

VIRTUAL VIRTUAL 002

Virtual Climate Change Student Symposium

Presenters: Katherine Carron, Brailee Duitsman, Sophia Elhart, Miranda Gonyeau, Christopher Kotkowicz,
Bushra Rashrash, Claire Samberg, Abigail Simcox
Mentor: Elena Lioubimtseva

This third annual Virtual Climate Change Student Symposium (VCCSS) brings together undergraduate student projects exploring climate change, environmental sustainability, human vulnerability, community resilience, and mitigation and adaptation solutions for the global climate crisis in a webinar format. This session includes four group presentations from different classes, projects, and disciplines. Bushra Rashrash and Katherine Carron will share their research project, titled "Equity and Inclusion in Climate Action and Adaptation Plans of Michigan Cities", funded by the R.G. Mawby Fellowship at the D. Johnson Center for Philanthropy. Katherine and Bushra will co-present their summer pilot study, titled “A Search for Happiness though Connection with Environment and Sustainability”, supported by a grant from the Office of Undergraduate Research at GVSU in summer 2023. Brailee Duitsman, Abby Simcox, and Miranda Gonyeau will share their ENS/GPY412 class research project, titled “Climate Change and its Effects on Banana Production in Central America”. Claire Samberg and Chris Kotkowicz will present their research on how climate change impacts the coral reefs in Australia, also developed in ENS/GPY412 this Winter. This webinar is supported by the GVSU CCESN and open to the public.

Link to join the webinar https://gvsu-edu.zoom.us/j/92314508367

Index of Presenters and Mentors

(Sorted by Last Name)

Hodson, Evan	Student
Hogan, Alaina	Student
Holder, Benjamin	Mentor
Holkeboer, Noah	Student
Hollister, Robert	Mentor
Holly, Jaysen	Student
Hosep, MJ	Student
Howard, Andrew	Student
Hoyt, Tyler	Student
Hudson, Elizabeth	Student
Hutchinson, Briana	Mentor
Huynh, Ammy	Student

I

Ignasiak, Emily	Student
Ingber, Andrew	Student

J

Jackson, Wesley	Mentor
Janes, Patty	Mentor
Jenkinson, Jennifer	Student
Jiang, Christina	Student
Johnson, Madeline	Student
Johnson, Piper	Student
Jones, Amani	Student
Jordan, Tessa	Mentor

K

Kailing, Simon	Student
Kamarudin, Dahlya	Student
Karabinus, Alisha	Mentor
Karsten, Amanda	Mentor
Katerberg, Cody	Student
Kenney, Carley	Student
Kenyon, Lisa	Mentor
Khoo, Sok Kean	Mentor
Kilbourne, John	Mentor
King, Mckenna	Student
Kleikamp, Brianna	Student
Kleitch, Josef	Student
Klimek, Allison	Student
Klimkewicz, Kelsey	Student
Knapp, Kyle	Student
Kolanowski, Mason	Student
Kopich, Joshua	Student
Korte, Adam	Student
Kramer, Chance	Student
Kurlinski, Joshua	Student
Kurmas, Zachary	Mentor

L

Lach, Kristen	Student
Lamorandier, Hailee	Student
Lane, Paul	Mentor
Langlois, Jamie	Mentor
Lantz, Andrew	Mentor
Larva, Miranda	Student
Laucky, Isaac	Student
Laudicina, Natalie	Mentor
Laverty, Owen	Student
Lawrence, Christopher	Mentor
Lenters, Geoffrey	Mentor
Leon, Paola	Mentor
Leonard, David	Mentor
Lerma, Nicholas	Mentor
Leslie, Zane	Student
Lilly, Alexis	Student
Lilly, Ian	Student
Lindsay, Cameron	Student
Lingwood, Chad	Mentor
Lioubimtseva, Elena	Mentor
Liu, Ruijie	Mentor
Lombardo, Michael	Mentor
Long, Emma	Student
Longstreet, Diana	Student
Lord, Kristen	Student
Lord, Richard	Mentor
Loveland, Emma	Student
Lubbers, Travis	Student
Lucas, Seth	Student
Luoma-Mannisto, Meryl	Student
Luttenton, Mark	Mentor
Lyman, Catherine	Student

M

Ma, Kin	Mentor
Maag, Annabel	Student
MacGregor, Logan	Student
Macauley, Beth	Mentor
Malysh, Julia	Student
Mangan, Erin	Student
Manschula, Micaela	Student
Mansoor, Sofia	Student
Maouene-Cavin, Josita	Mentor
Mardlin, Logan	Student
Maring, Jacob	Student
Mason, Julia	Mentor
Mast, Katherine	Student
Masters, Lynsey	Student
Maurer, Madelyn	Student
Maurer-Wagner, Ashton	Student
McBride, Hannah	Student
McCabe, Jonathan	Student
McGillicuddy, Lacey	Student
McGinnis, Allison	Student
McGovern, Callahan	Mentor
McGuckin, Ian	Student
McKenzie, Lauren	Student
McLean, Erin	Student
Medina, Jocelyn	Student
Meindertsma, Aubrey	Student
Miedema, Trenton	Student
Miller, Ava	Student
Miller, Caitlin	Student
Miller, Emma Ann	Student
Miller, Grace	Student
Mills, Bradyn	Student
Molloseau, Jacquelyn	Student
Monarch, Bradley	Student
Monroe, Halle	Student
Monte, Gabriella	Student
Montgomery, Amanda	Student
Moore, Jared	Mentor
Morales, Citlali	Student
Moran, Katherine	Mentor
Morgan, Rod	Mentor
Mosack, David	Student
Murray, Emily	Student
Mwanda, Sheila	Student
Myers, Kayla	Student

N

Nandamudi, Srihimaja	Mentor
Newton, Michelle	Student
Nicholson, Marshall	Student
Niederer, Madison	Student

O

O'Dell, John	Student
Oberlin, Michelle	Student
Olen, Tara	Student
Ortiz-Robinson, Norma	Mentor
Otieno, Sango	Mentor
Ottinger, Grace	Student
Overbeck, Kendahl	Student
Owen, Michaela	Student
Owen-DeSchryver, Jamie	Mentor
Owsley, Terra	Student

P

Page, Haley	Student
Pandel, Dirk	Mentor

White, Jillian	Student
Wiggins, Marcel	Student
Williams, Rhian	Student
Williams, Todd	Mentor
Williamson, Faith	Student
Wilmore, Lauren	Student
Wilson, Andrew	Student
Wilson, Jurrien	Student
Winenger, Grant	Student
Winkelstern, Ian	Mentor
Wintermantel, Julia	Student
Winther, Jennifer	Mentor
Wisneski, Kamryn	Student
Wolfe, Michael	Mentor
Wolfgang, Seth	Student
Wright, Diane	Mentor
Wroblewski, Michael	Mentor
Wyniemko, Katherine	Student

X

Xu, Gang	Mentor

Y

Yingling, Jacob	Student

Z

Zaszlavik, Katalin	Mentor
Zelenak, Isabella	Student
Ziegler, Emmerika	Student
Zylman, Hannah	Student

Online Schedule Builder

Updated Presentation Information in lieu of Printed Addendum

This book is printed with information current as of mid-February. Changes often occur after the print date, and are reflected online on the Schedule Builder.

To access the Schedule Builder:

1. Go to gvsu.edu/ours/ssd
2. Click on the “Schedule Builder” link
3. Login and follow instructions

We are here to help. Please let any SSD committee member or SSD volunteer know if you have any questions. You may also contact the Office of Undergraduate Research and Scholarship at ours@gvsu.edu and/or 616-331-8100.

Office of Undergraduate Research and Scholarship
230 Mary Idema Pew Library
1 Campus Drive
Allendale, MI 49401
E-mail: ours@gvsu.edu
Phone: 616-331-8100
Business Hours: Monday-Friday, 8:00 AM - 5:00 PM

“Establishing comprehensive services and programs which support students in their pursuit of inquiry, creativity, scholarship, and research.”

GRAND VALLEY STATE UNIVERSITY
OFFICE OF UNDERGRADUATE RESEARCH AND SCHOLARSHIP