

**The 22<sup>nd</sup> Annual**  
**Symposium**  
**of Undergraduate Research &  
Creative Scholarship**

**Thursday, April 21, 2022**

**12:00-6:00 p.m.**

**Pierson Auditorium**

**Online Presentations**

**Open for Discussion in Canvas**

**Thursday & Friday, April 21 & 22**

**UMKC**



## **Office of Undergraduate Research and Creative Scholarship**

[www.umkc.edu/searchsite/](http://www.umkc.edu/searchsite/)

The Office of Undergraduate Research and Creative Scholarship supports high-impact learning opportunities by funding the work of undergraduate researchers, scholars, and artists; linking students with research opportunities; providing opportunities for students to enhance intellectual and career-building skills; and supporting faculty mentorship.

### **Staff**

Jane Greer, PhD, Director

Audrey Lester, Assistant Director

Sherry Neuerburg, Office Support Assistant

### **Faculty Advisory Board**

Majid Bani-Yaghoub, Mathematics

Leonard Dobens, Biological Sciences

Travis Fields, Civil and Mechanical Engineering

Amanda Graettinger, Earth & Environmental Sciences

Jane Greer, English

Amanda Grimes, Health Sciences

R. Scott Hawley, Stowers Institute

Saul Honigberg, Biological Sciences

Kimberly Johnson, Multicultural Student Affairs

Seung Lark Lim, Psychology

Debra Leiter, Political Science

Paul Rulis, Physics

Jeff Rydberg-Cox, Classical Studies

### **Student Ambassadors**

Victor Arellano, Public Health

Maya Baughn, Health Sciences

Kyle Broley, Earth & Environmental Sciences

Polina Krasnopolskya, Music Education

Trenton McEnaney, Earth & Environmental Sciences

## **22<sup>nd</sup> ANNUAL SYMPOSIUM OF UNDERGRADUATE RESEARCH & CREATIVE SCHOLARSHIP**

Thursday, April 21, 2022

12:00-6:00 p.m.

Atterbury Student Success Center, Pierson Auditorium

- 12:30-2:00 Poster Judging—Even Numbers
- 2:00-3:30 Poster Judging—Odd Numbers
- 3:00 Oral Presentations Judging (Chancellor's Dining Room)
- 4:00-5:00 Mixer for Undergraduate Researchers, Scholars, Artists,  
and Friends
- 5:00-6:00 Awards Ceremony
  - Welcome
  - Keynote Speaker
  - Recognition
    - EUREKA Students and Faculty
    - Undergraduate Research Associates and  
Mentors
    - Undergraduate Research Fellows
    - Emerging Research Scholars
  - Announcement of Presentations of Distinction
  - Announcement of Awards for Excellence in  
Mentoring

Thursday and Friday, April 21 and 22, 2022

Virtual Presentations from Online Asynchronous EUREKA Courses

Canvas: <https://umsystem.instructure.com/enroll/8M9LKT>

## **AWARDS CEREMONY KEYNOTE SPEAKER**

### **Bryan Meyer**

CEO of Veterans Community Project

Alumnus of the Year 2022

Bryan Meyer served in the Marine Corps for five years before coming to UMKC to earn his bachelor's degree, JD, and MPA. Following graduation in 2015, he then turned his attention to helping fellow veterans by helping to establish the Veterans Community Project (VCP) in Kansas City.

He now serves as the CEO of VCP, which is an innovative non-profit that provides housing for homeless veterans in the VCP Village. The Village setting also provides a sanctuary and emotional space needed for the Veteran. Here the VCP's Veteran Support Services thoroughly addresses the underlying causes of his or her homelessness and VCP's specially trained case managers work to achieve incremental, lasting results in the areas of health and wellness, education, employment, financial literacy, and the development of a personal support network. As CEO, Bryan is driven by service and is passionate about building an organization that is here to serve veterans and all of Kansas City.

Bryan is deeply committed to making sure that no veteran is left behind. Bryan and his staff have been able to engage a broad base of the community to rally behind the project. That engagement speaks to Bryan's leadership and his unwavering dedication to get the job done. The work they have done here in Kansas City will be used as the national model to ensure our nation's veterans have the services they need and the support they deserve.

## **AWARDS FOR EXCELLENCE IN MENTORING UNDERGRADUATE RESEARCHERS, SCHOLARS, AND ARTISTS**

### **Majid Bani-Yaghoub**

Associate Professor and Chair, Department of Mathematics and Statistics

Dr. Majid Bani-Yaghoub's interdisciplinary research employs mathematical and statistical modeling to investigate questions in ecology, health, and biomedicine. Since he joined UMKC's Department of Mathematics and Statistics in 2012, Dr. Bani has taken an innovative approach to involving undergraduate students in research through student clubs, EUREKA courses, and interdisciplinary collaborations. Dr. Bani's students note that circulating their research findings has been significant to their learning, which they have done through presentations at UMKC's symposia and at Mathematical Association of America conferences. Students have also co-authored articles that have appeared in undergraduate research journals as well as the *Journal of Agricultural and Biological Sciences*.

### **Virginia Blanton**

Curators' Distinguished Professor, Department of English Language and Literature

For 20 years, Dr. Virginia Blanton has been helping UMKC students turn their curiosity into scholarly inquiry. As a Curators' Distinguished Professor in the Department of English Language and Literature, Dr. Blanton has an active research agenda that focuses on medieval women and their relationship with books as writers, readers, patrons, and book owners. Most students first encounter Dr. Blanton's research in the classroom, and their interest morphs into collaborative research projects. Her students have conducted research in the Nelson-Atkins Museum's Spencer Art Reference Library and UMKC's LaBudde Special Collections, completing projects that led to campus and regional presentations as well as co-authored publications.

### **Amanda Grimes**

Assistant Professor, School of Nursing and Health Sciences

Dr. Amanda Grimes began teaching at UMKC in 2013 and became an assistant professor in UMKC's School of Nursing and Health Studies in 2018. Her community-based health research, which focuses on active transportation and the health and social influences associated with physical activity across demographic groups, offers her students the opportunity to conduct research on health behaviors and populations that interest them. By developing EUREKA courses for the health studies program's curriculum, Dr. Grimes offers research opportunities to large groups of students each year, and many of those students are inspired to continue their work with student-led research projects. Undergraduate student researchers working with Dr. Grimes have procured funding through SEARCH, SUROP, and ADVANCER, and have presented their work in campus, regional, and national conferences. Students' coauthored publications have appeared in *Health Education & Behavior* and *Pediatric Exercise Science*.

## UNDERGRADUATE RESEARCH ASSOCIATES

Undergraduate Research Associates gain new research skills and hands-on experience while collaborating with a faculty mentor. This program is funded through Federal Work-Study awards.

Kyle C. Broley, Earth & Environmental Sciences BS

Mentor: Dr. Alison Graettinger

Javier Camacho, History BA

Mentor: Dr. Diane Mutti Burke

Luz Moreno Chepe, Political Science BA

Mentor: Dr. Mona Lyne

Victoria Dominguez, Spanish BA & Sociology BA

Mentor: Dr. Viviana Grieco

Dylan Hood, Mathematics & Statistics BS

Mentor: Dr. Mauch

Sylvia Jeffress, Theatre BA

Mentor: Dr. David Trowbridge

Polina Krasnopolskaya, Music Education BME

Mentor: Dr. Lani Hamilton

Harshi Kumaresain, Medicine MD-Six Year Program

Mentor: Dr. Carole Bowe Thompson

Mercedes Madison, Biology BS

Mentor: Dr. Cynthia Russell Lippincott

Zaib Malik, Biology BS

Mentor: Dr. Tim Cox

Donald Melton, Earth & Environmental Sciences BS

Mentor: Dr. Fengpeng Sun

Aminata Sesay, Psychology BA

Mentor: Dr. Bruce

Jocelyn Vang, Biology BS

Mentor: Dr. Mark Johnson

Jennifer Vanderslice, Physics BS

Mentor: Dr. Paul Rulis

## **EMERGING RESEARCH SCHOLARS**

Through the Office of Multicultural Student Affairs, students who participate in the Emerging Research Scholars program receive academic, social, and financial support while becoming integrated into the intellectual climate of the university. Scholars are matched with faculty mentors in their field of study and attend presentations, panel discussions, and workshops to gain additional support for their research experiences. All Emerging Research Scholars present at UMKC's Annual Symposium of Undergraduate Research and Creative Scholarship.

Niveen Al-Saoudi, Class of 2022

Jazmin Bustos, Class of 2023

Jetzel Chavira, Class of 2024

Victoria Dominguez, Class of 2022

Alejandra Frias Fraire, Class of 2023

Sylvia Jeffress, Class of 2025

Hannah Leyva, Class of 2024

Zaibunnisa Malik, Class of 2023

Amanda Mercier, Class of 2022

Sasha Mitton, Class of 2023

## **UNDERGRADUATE RESEARCH FELLOWS FALL 2021**

### **Kyle C. Broley**

Earth & Environmental Sciences BA, Class of 2022

Kyle Broley developed his research question based on his interest in a volcano in Colorado. After conducting preliminary research and consulting with his faculty mentor, he secured SUROP grant funding to collect and analyze samples of sediment from the site. Kyle first presented his project, “An Examination of Xenolith Structures in Welded Basalt Agglutinate associated with Dotsero Crater, Colorado,” at the SUROP Symposium in September 2021 and plans to present it in several more venues before graduation.

### **Jared Gutzmer**

Music Performance BM, Class of 2022

An independent study course on the influence of the philosophical concept of modernism in art led Jared Gutzmer to investigate classical saxophonist Sigurd Rascher’s attitudes toward modernism. With SUROP grant funding, Jared obtained materials Rascher’s unpublished personal writings, which provided insight not only to Rascher’s attitudes toward modernism, but also to his connections to the Kansas City area. Jared presented his research at the SUROP Symposium in September 2021, and plans to submit a longer paper for publication and pieces relevant to this work in upcoming competitions.

### **Jade Robichaud**

Psychology BA, Class of 2022

Jade Robichaud worked with her faculty mentor to develop innovative methods to answer her research questions related to the association of BMI to food-related behaviors. Technology played a key role in Jade’s study, both by using a mouse-tracking paradigm to measure inhibition with food cues and by using open-source programming tools to analyze the data. Jade presented her poster, “Measuring Inhibitory Controls to Food Cues Using a Mouse-Tracking Paradigm” at the SUROP Symposium in September 2021.



## **UNDERGRADUATE RESEARCH FELLOWS FALL 2021**

### **Karah Chappel**

Music Therapy BA, Class of 2022

After becoming interested in trauma care related to criminal justice, Karah Chappel reviewed related literature, met with experts in the field, and discussed her ideas with her faculty mentors to narrow the focus of her research question. She designed a phenomenological study and obtained the required approvals before conducting interviews. Karah presented her paper “Exploration of the Referral Process of Social Work within a Policing Structure” at UMKC’s Annual Symposium in Spring 2021, and has plans to publish and present this paper again before graduation.

### **Nikita Joshi**

History BA and English BA, Class of 2022

Nikita Joshi’s research projects explored the Indian subcontinent and the larger geopolitical region of South Asia. She completed literature reviews, identified gaps in existing scholarship, and analyzed source material to gain a better understanding of the region’s social and political landscape of the time. She presented her paper “Public Discourse and India's Green Revolution: Defining Approaches to Relief Efforts and Policymaking During the Bihar Famine” at the History Department’s Symposium in December 2021.

## EUREKA COURSES

Experiences in Undergraduate Research are available to students early in their academic careers through EUREKA Courses. In these courses, students build a relationship with a faculty mentor, learn and practice research skills and scholarly methods, complete a research project, and present their work at UMKC's Annual Symposium of Undergraduate Research and Creative Scholarship.

In Spring 2022, students enrolled in in-person EUREKA Courses are presenting posters in-person in Pierson Auditorium, and students enrolled in online asynchronous EUREKA Courses are presenting their work online in Canvas: <https://umsystem.instructure.com/enroll/8M9LKT>.

### **Biology H206 Genetics**

Instructors: Dr. Saul Honigberg and Dr. Scott Hawley

*Students in this section are presenting in person.*

### **GECRT-SC 101 Living in a Changing World: Nature's Fury**

Instructors: Prof. Joseph Nolan and Dr. Alison Graettinger

*Students in this section are presenting online.*

### **GECRT-SS 111 Health Issues in Aging**

Instructors: Prof. Jessica Bergner and Dr. Amanda Grimes

*Students in this section are presenting online.*

### **PBHL 158 Public Health Principles**

Instructor: Dr. Joey Lightner

*Students in this section are presenting online.*

### **PBHL 496 Evidence-Based Public Health Capstone & Seminar**

Instructor: Dr. Joey Lightner

*Students in this section are presenting online.*

## **KC WORKS**

As Kansas City's research university, UMKC seeks to partner with local constituencies and to leverage the expertise of the university's faculty, staff, and students in addressing community needs. At the Annual Symposium of Undergraduate Research and Creative Scholarship, we celebrate the work of students whose research, scholarship, and artistry is deeply engaged with the greater Kansas City region.

## 22<sup>ND</sup> ANNUAL SYMPOSIUM OF UNDERGRADUATE RESEARCH & CREATIVE SCHOLARSHIP

### POSTER LINEUP

1. Elisa Rouse-Salcido Biology  
*Characterizing Oral Mycobiomes in Domestic Dogs*
2. Victoria Dominguez Spanish/History  
*Student Life Through the Art of Luis Quintanilla: A Study of the Murals in Haag Hall*
3. Nhu Do, Nghi Nguyen, Kara Constanzo, Biological Sciences  
& Dayanne Cornelio Parra  
*Correlation between Neural Localization of Ataxin-7 and K48 Proteins and Circadian Rhythm in Spinocerebellar Ataxia Type 7*
4. Grace Bradley English  
*Don't Poke the Bear: The Impact of Language on the Safety of our National Parks' Most Misunderstood Animal*
5. Maya Baughn, Niveen Al-Saoudi, & School of Nursing & Health Studies  
Macy Hornosky  
*Perception of the COVID-19 Vaccine among Missourians aged 15-21 Years Old*
6. Morgan James, Natalie McCarthy, & Kelsey Winemiller Biology  
*Gene Silencing of the DabA Gene in Pseudo-nitzschia*
7. Ekjoatroop Kaur, Sydney Nolte, & Duha Ahmad Biology  
*Cyanocobalamin Synthesis Insert in Agrobacterium Tumefaciens*
8. Rocio Alvarado-Pizano English  
*Michelle Obama's Usage of Ethos in the Let's Move! Campaign*
9. Asayiel Alhajeri Chemistry  
*Measuring the Thickness of Diffusion Layer in Thin Layer Electrochemical Cells with Optical Microscope*
10. Jacqui White, Grace McKown, Maddie Vanderbeck, & Biology  
Chloe McAdams  
*Pyrethrin Insecticide Gene Insert in Bananas*
11. McKenna Cape English  
*A Dope Discourse: How USA Swimming Paints the Picture of the Perfect Athlete*

12. Zalyia Carr Psychology  
*Diagnoses Differences of Childhood Mental Disorders Among Black Women*
13. Heidi Carmoney English  
*Diabetes Speak: A Rhetorical Study of Television Advertisements for Diabetes Medication*
14. Reese Wood, Caden Wehner, & Benjamin Vandenburg Biology  
*Recombinant Ant-CD3 Producing E. Coli*
15. Cole Biesemeyer School of Biological and Chemical Sciences  
*Gene Expression Analysis in the Zebrafish Lateral Line*
16. Eric Clarke English  
*The Paper War, a Rhetorical Comparative Analysis of Propaganda Posters from Great Britain and the German Empire during World War I*
17. Daniel Caron Civil Engineering  
*Augmenting BIM with Real Time 3D and Damage Analytics*
18. Kyle Broley Earth & Environmental Sciences  
*Xenolith Structures in Welded Basalt Agglutinate Associated with Dotsero Crater, Colorado*
19. Alyssa Corley, Tinh Nim, & Christopher Viermann Genetics, Developmental and Evolutionary Biology  
*Analysis of Light-Dependent Regulation of BDBT in the Eye*
20. Christian Dang Biological and Chemical Sciences  
*Examining the Tribbles Pseudokinase as a Mediator between the Opposing Transcription Factors C/EBP and Cut during Drosophila Development*
21. India Collins English  
*Rhetorical Storytelling in the Legal Field*
22. Cristina Chavez-Arnst Political Science  
*Was South Africa a Democracy Under Nelson Mandela?*
23. Sasha Dellenbaugh English  
*"The Connection is You": Understanding the Use of Empathetic Rhetoric toward the Autism Community*
24. Sabrina Doughty School of Biological and Chemical Sciences  
*Morphological Comparison of Turtle Beaks in the Context of Lifestyle Traits*

25. Jordy Hernandez School of Biological and Chemical Sciences  
*Tackling Cancer with Yeast: Determining the  
Nonautonomous Effects of Cyclin Alleles*
  
26. Joel Busch & Brittany Longwell Mathematics & Statistics  
*A Mathematical Model to Analyze Vector Transmission and Dynamics of Barley  
Yellow Dwarf Viral Coinfection*
  
27. Gabi Exendine English  
*A Genre Analysis of Bedroom Pop, and How It Defines and Influences the Lyrical  
Writing Process of Clairo*
  
28. Ian Coffman School of Nursing and Health Studies  
*Getting Around KC*
  
29. Sylvia Jeffress History  
*The Evolution of Healthcare in Kansas City*
  
30. Lakshmi Kasi & Mirdhula Ananthamurugan Biological and Health Sciences  
*Case Study: Reversible Cerebral Vasoconstriction Syndrome—A Delay in Diagnosis*
  
31. Sophia Couteranis Psychology  
*The Effect of Parent and Sibling Relationships on Prosocial Behavior in Young Adults*
  
32. Lakshmi Kasi, Julia Cozort & Taylor Bradish Clinical Neuropsychology Lab  
*Sleep, Pain and Cognition in Individuals with MS and Obesity*
  
33. Cullen Moriarty Earth and Environmental Sciences  
*Using Climate Models and Crop Modeling Systems to Project Crop Yields in Kansas*
  
34. Addison Ferren English  
*The American Media's Shift from Sensationalism to Scolding of China's One Child  
Policy*
  
35. Emma Leonard English  
*Sports and Gender: A Comparative Historical Analysis of Men's and Women's Sports  
in the United States*
  
36. Amanda Pierce Earth and Environmental Sciences  
*The Effectiveness of Sphagnum subsecundum Moss Removal of Dissolved Carbon  
Dioxide and pH Balancing of Missouri Freshwater*
  
37. Ethen Kimmel Biology  
*Geometric Morphometric Analysis of Crocodilian Armor*

38. Rachael Fritz Psychology  
*An Examination of the Impact of the COVID-19 Pandemic on Alcohol Consumption at the College Level*
39. Jacob Lobdell English  
*Exploring the Rhetorical Discourse of Therapy Sessions Through the Examination of an Interview with a Practicing Therapist*
40. Jennifer Vanderslice Physics  
*Crafting Continuous Visuals for Electron Band Structures*
41. Amari Holland, Sally Vo, Ben Wilson, & Weston Womack Political Science  
*Testing Theories of Civic Engagement in a General Education Course*
42. Maggie Maenner English  
*Gender-Based Microaggressions in the Film Industry: As Seen in Jimmy Kimmel Interviews*
43. Michael Kuehn Biological and Life Sciences  
*Genetic Signaling Pathways Promote Hair Cell Regeneration in Zebrafish*
44. Hannah Leyva Sociology, Honors Program  
*Understanding Latinx Students at an Urban Research University*
45. Makayla Mead English  
*Healthcare Communication During Pandemics: Reaching Specific Audiences*
46. Mercedes Madison School of Nursing and Health Studies  
*Managing Medications During a Pandemic: A Mixed-Methods Study of Perception of Adult Kidney Transplant Recipients and Those Waiting for a Kidney Transplant*
47. Brenden Mosher English  
*How the Industry Restricts Art: Liberation from Commodification in Frank Ocean's Blonde*
48. Zaibunnisa Malik Oral & Craniofacial Sciences  
*Investigating the Impact of Maternal Dietary Vitamin A on Susceptibility to Cleft Lip/Palate*
49. Grace Nanney Psychology  
*Identifying Relationships between Eating Behaviors and Coping Styles*
50. Truong Nguyen & Nicholas Frede Biology  
*Comparison of RT-PCR Methods for Detecting and Measuring RNA Lariats*

51. Thecla Okwara English  
*Virtual Therapy Website / In-person Therapy Website: What Works Best for You*
52. Shea O'Connor Molecular Biology and Biochemistry  
*AI and The Fly*
53. Logan Sabin Genetics, Developmental, and Evolutionary Biology  
*Foxg1a in Zebrafish Hair Cell Regeneration and Development*
54. Carrine Spinks Psychology  
*Qualitative Coding of Treatment Alliance through a Pandemic*
55. Taylor Shores & Luke Whistler Biological Sciences  
*The Knockdown of SAGA Complex-Associated Genes Linked to Neurodegenerative Disease*
56. Emma Rucker English  
*Prisoner Apology Letters as a Way of Redemption and Rehabilitation in the Restorative Justice Process*
57. Adreanna Starnes English  
*Continuing the Conversation: A Deeper Look into the Rhetoric of Mental Health Resources*
58. Lauren Van Winkle School of Nursing and Health Studies  
*Analyzing LGBTQ+ Patient Experiences and the Potential of Affirmative-Based Practices*
59. Kyla Vazquez School of Biological and Chemical Sciences  
*Investigating the Regulation of IME1 and IME2 by CIT1 and CIT2 with Chimeric Colony Assays*
60. Trenton McEnaney Earth and Environmental Sciences  
*Relocating the Ground Rupture of the 1976 Guatemala Earthquake in the Field*
61. Carmen Gudino English  
*Bilingualism: Benefit or Burden?*
62. Alejandra Frias Fraire Earth and Environmental Sciences  
*Armourdale's Correlation Between Industry Pollution and Health Inequity*



## ORAL PRESENTATIONS AND PERFORMANCES

3:00 p.m. Karah Chappel

Conservatory

*Exploration of the Education and Experiences of Music Therapists in Trauma Care*

## ONLINE PRESENTATIONS FROM STUDENTS IN EUREKA COURSES

### GECRT-SC 101 Living in a Changing World: Nature's Fury

Ethan Bennett

Earth & Environmental Science

*Poverty and Its Relation to Hurricanes*

Emily Bledsoe, Hailey Kerner, Avery Krahenbill,  
Leslie Perez, Jesse Serrano, & Trey Thompson

Earth & Environmental Science

*How Do Hurricanes Affect the Mississippi River Delta?*

Daisy Ferguson, Nadia Saavedra, Alondra Meija,  
Nadeya Marchan, & Sarah Ruhmann

Earth & Environmental Science

*The Effect Hurricanes Have on Coral*

Sydnee Flowers, Cara Braithwaite, &  
Haylee Harrell

Earth & Environmental Science

*The Effect of East Coast Hurricanes on Loggerhead Turtles*

Sophia Grantham, Emma Byrne, &  
Hugo Mongalvy

Earth & Environmental Science

*How Hurricanes affect Agriculture in the Southern States*

Ethan Kauffman, Caitlin Ayala, Rachel Simeon, &  
Zowie Hayes

Earth & Environmental Science

*Piping Plover Plight?*

Lauren Kreisel, Rocio Alvarado, &  
Aurora Conroy

Earth & Environmental Science

*Essentials People at Risk Need to Keep in their Hurricane Survival Kit*

Jacob Lobdell, Charles Bonadonna, Drummon  
Johnson, & Jenny Rodriguez

Earth & Environmental Science

*Building on Borrowed Time 2: Hurricane-Boogaloo*

Daniela Mendez, Alice Rodriquez, Erin Thessen,  
& Holly Vervaecke Earth & Environmental Science

*Hurricanes: Blowin' Away Unemployment Rates*

Leah Pappert, Audrey Westenbroek, Kaylee  
Kytasaari, & Lillian Johnson Earth & Environmental Science

*How Does Climate Change Affect the Intensity of Hurricanes in the United States?*

Deesha Patel, ThuyVy Nguyen, Mattie Martin, &  
Addison Bright Earth & Environmental Science

*Hurricane Effects on Sea Turtles Nesting Habits, Habitat, and Whether Speed Affects Their Safety*

Ben Poole, Thomas Mitchem, Dallas Welch, &  
Deanna Hoenshell Earth & Environmental Science

*Effects of Hurricanes on Birds in the Gulf of Mexico*

Jhalisa Robinson, Racheal Jose, Emma Odell,  
Tamia Bond, & Sarah Melvin Earth & Environmental Science

*How Did Hurricanes Impact the Seafood Industry Over the Past 20 Years?*

Alliyah Thanawalla, Amna Bilal, & Justus Peuser Earth & Environmental Science

*How Hurricanes affect Agriculture*

Alex Unseth, Kara Kirkland, & Airrisa Wilson Earth & Environmental Science

*Sunshine State Businesses in the Dark: The Effects of Hurricane Irma on Florida's Economy*

Taylor Urbanek Earth & Environmental Science

*The Effect of Hurricanes on Coral Colonies in the Caribbean*

## **GECRT-SS 111 Health Issues in Aging**

Isabel Aguado School of Nursing & Health Sciences

*Financial Wellbeing of Older Adults*

Rayan Al-Hamdi School of Nursing & Health Sciences

*An Investigation of Three Effects on Aging and Retirement*

Ayra Ali School of Nursing & Health Sciences

*Analyzing Sources of Healthcare and Retirement Financing for Older Women*

Jeanna Allen	School of Nursing & Health Sciences
<i>Fighting Difficult Times</i>	
Thomas Bellman	School of Nursing & Health Sciences
<i>How Financial Insecurity as a Child Impacts Older Adults Later in Life</i>	
Abbie Cafazza	School of Nursing & Health Sciences
<i>Geriatric Health Factors and the Improvements in Geriatric Medicine</i>	
Cameron Cobb	School of Nursing & Health Sciences
<i>Older Generations Opinions and Perspectives on the Health Care System</i>	
Lydia Cripe	School of Nursing & Health Sciences
<i>Differing Understanding of Sexuality Across Generations</i>	
Adrianna Cusimano	School of Nursing & Health Sciences
<i>How Do Gender Roles Affect You? Or Do They?</i>	
Audrey Danielson, Thao Lam, Nhi Nguyen, & Natasha Hillard	School of Nursing & Health Sciences
<i>Management of Mental Health Variation among Older Adults and Contributing Factors</i>	
Grace Filer	School of Nursing & Health Sciences
<i>Aging Adults in a Digital Age</i>	
Rishabh Gaur	School of Nursing & Health Sciences
<i>Old Is Gold! Or Is It?</i>	
Annabelle Gettys	School of Nursing & Health Sciences
<i>The Generational Divide and Political Beliefs</i>	
Leah Green	School of Nursing & Health Sciences
<i>Older Adults Perception on Their Current Financial Living Situation, and How Their Childhood Affected Their Adulthood</i>	
Natasha Hillard	School of Nursing & Health Sciences
<i>Progression of Mental Health in Older Adults</i>	
Arinze Ihenacho	School of Nursing & Health Sciences
<i>Impact of Age and Attitude on Gender Roles</i>	

Sierra Johnson	School of Nursing & Health Sciences
<i>What Do They Say? Generational Perspectives on Sexual Orientation</i>	
Saad Khan	School of Nursing & Health Sciences
<i>The Priorities of Older Americans in Healthcare</i>	
Thao Lam	School of Nursing & Health Sciences
<i>Factors Impacting the Varying Management of Mental Health among Older Adults</i>	
Rami LeRoy	School of Nursing & Health Sciences
<i>Generational Views and Health Care</i>	
Sarah Love	School of Nursing & Health Sciences
<i>The Health Effects of Aging in America</i>	
Tiffany Lowell	School of Nursing & Health Sciences
<i>Lack of Accessible Information for Older Generations to Improve Personal Health</i>	
Ousman Malik	School of Nursing & Health Sciences
<i>Perspective of Older Generations Regarding their Health and the Healthcare of the Country</i>	
Audrey Manivong	School of Nursing & Health Sciences
<i>Physical Health Discoveries affecting Older Generations</i>	
Kyle Masson	School of Nursing & Health Sciences
<i>Destroying Stereotypes Associated with Aging and Health</i>	
Hanna Mattox	School of Nursing & Health Sciences
<i>Perspectives on Gender Roles in Healthcare with Older Adults</i>	
Evan McDaniel	School of Nursing & Health Sciences
<i>The Effect of Retirement on Aging</i>	
Morgan McLaughlin	School of Nursing & Health Sciences
<i>Does an Increase in Age Cause Changes in the Way Patients are Treated?</i>	
Makayla Mead	School of Nursing & Health Sciences
<i>Decades Interviews: The Knowledge of Older Generations on Sexual Orientation and Its Relations to Healthcare</i>	

Alyssa Mesh	School of Nursing & Health Sciences
<i>Generations Perceptions of Technological Advancements and Barriers Impacting Everyday Life and Healthcare Systems</i>	
Ben Mings	School of Nursing & Health Sciences
<i>How are Conservative Beliefs Related to Wellbeing</i>	
Sasha Mitton	School of Nursing & Health Sciences
<i>Social Media, Technology and Older Adults</i>	
Amy Mohrmann	School of Nursing & Health Sciences
<i>The Impact of Health Discoveries on Aging Generations</i>	
Cadao Nguyen	School of Nursing & Health Sciences
<i>Impact of Gender Roles on Mental Health and Healthcare Experiences</i>	
Nhi Nguyen	School of Nursing & Health Sciences
<i>Mental Health and Older Adults</i>	
Ayla Nguyen	School of Nursing & Health Sciences
<i>Polypharmacy and Informed Consent: Perspectives from Aging Patients</i>	
Emma Odell	School of Nursing & Health Sciences
<i>Generational Financials in Relation to Affordability of Health Care</i>	
Sydney Reid, Saad Khan, Corby Schmitz, Kyle Masson, & Cameron Cobb	School of Nursing & Health Sciences
<i>Attributes the Older Generation Prioritizes When Considering Physicians</i>	
Austin Rexroad	School of Nursing & Health Sciences
<i>If You're Happy and You Know It, Take Your Pills</i>	
Taylor Russell	School of Nursing & Health Sciences
<i>Patient Satisfaction in Older Adulthood</i>	
Corby Schmitz	School of Nursing & Health Sciences
<i>Older Adult Priorities When Deciding on a Physician</i>	
Fatima Shahab	School of Nursing & Health Sciences
<i>Social Media, Technology, and Health: The Perspective of Older Generations vs. Society</i>	

Adnan Shaik	School of Nursing & Health Sciences
<i>Older Adult Patient Attitudes toward Healthcare</i>	
Elijah Simpson	School of Nursing & Health Sciences
<i>Viewpoints from the Older Generation on Sexual Orientation in Healthcare</i>	
Emma Sinclair	School of Nursing & Health Sciences
<i>He/Him/Healthcare: Generational Shifting of Gender Roles</i>	
Tyler Smith	School of Nursing & Health Sciences
<i>Differences in Health Information Access among Older Generations</i>	
Tyesha Smith	School of Nursing & Health Sciences
<i>How Have Physical Health Discoveries Developed over the Year to Help Older Generations?</i>	
Lisa Tarantola Tarantola	School of Nursing & Health Sciences
<i>The Older Generational Views of the Growing Acceptance of Sexual Orientation</i>	
Sarah Thalken	School of Nursing & Health Sciences
<i>How Have Financial Challenges Been Presented and Managed in the Lives of Older Adults</i>	
Sydney Thomas	School of Nursing & Health Sciences
<i>Health Interpretation of Older Adults</i>	
Sebastian Torres	School of Nursing & Health Sciences
<i>The Evolution of Health-Related Discussion as People Age</i>	
Aishani Vengala	School of Nursing & Health Sciences
<i>Perspectives on the Mental, Physical, and Financial Determinants of Aging and Retirement</i>	
Jaquie Villanueva	School of Nursing & Health Sciences
<i>Financial Barriers in Older Generations</i>	
Hana Visio	School of Nursing & Health Sciences
<i>Generational Gaps in Beliefs: Where Do They Differ and Why?</i>	
Sophia Waibel	School of Nursing & Health Sciences
<i>Lifelong Health Effects of Childhood Poverty</i>	

School of Nursing &amp; Health Sciences

School of Nursing &amp; Health Sciences

School of Nursing &amp; Health Sciences

## Technology's Impact on Older Adults

## School of Nursing &amp; Health Sciences

### *Effect of Household Income on Cancer Treatment in the U.S.*

School of Nursing &amp; Health Sciences

School of Nursing &amp; Health Sciences

## *What Is the Correlation between Alcohol Consumption and Oral Health in the 2020 Pandemic?*

School of Nursing &amp; Health Sciences

### *Mental Health and Income by Race*

School of Nursing &amp; Health Sciences

## *The Relationship between Ovarian Cancer and Women's Public Health*

## **PBHL 496 Evidence-Based Public Health Capstone & Seminar**

Amelia Brady

School of Nursing & Health Sciences

*An Examination of COVID-19 Vaccination Rates in Independence, Missouri, and Recommended Vaccination Strategies*

Bryanna Contreras

School of Nursing & Health Sciences

*Evaluation of the Ida Mae Clinic at Uzazi Village*

Zainab Habib

School of Nursing & Health Sciences

*Using Qualitative Research to Evaluate the Likes and Dislikes of a Mhealth Physical Activity Program: Active KC Program*

Paige Riggs

School of Nursing & Health Sciences

*Evaluating the Factors that Influence Missed Appointments at a Community Health Center*

Nancy Ziegler

School of Nursing & Health Sciences

*Community Health Improvement Plans and Physical Activity Implementation Strategies: Findings From a Cross-Sectional Survey of US Local Health Departments*



# ARTS & HUMANITIES

**Rocio Alvarado-Pizano**

Faculty Mentor: Dr. Jane Greer

Academic Unit/Department: English

Funding: n/a

### **Michelle Obama's Usage of Ethos in the Let's Move! Campaign**

The Let's Move! campaign initiated by the first lady, Michelle Obama, launched in February of 2010. Michelle Obama intended to reach all audiences across the United States in an effort to prevent the continuous growth of childhood obesity. This study includes the rhetorical analysis of Michelle Obama's anniversary speech, at the one-year launch celebration of the Let's Move! campaign. This speech has revealed that Michelle Obama uses ethos to convey the messages of the Let's Move! campaign. This ethos includes reaching out to parents as a parent to convey the messages of the Let's Move! campaign and the ethos of being a motherly figure to the country, which is the role first ladies often take given they are women. In her speech, Michelle Obama was clear to use wordage that involved her as a parent, and phrases that suggested she was the protector of the nation's children, among other common patterns. The research concluded that Michelle Obama, was able to fit into the mold, created by other first ladies, while actively advocating for parents that were just like she had been a few months prior, furthermore, this enhances the positive response to the Let's Move! campaign. Michelle Obama's effective use of her past experiences, and personal characteristics, is what made the speech enhance the message. This speech can be used as a model for proceeding first ladies.

## **Grace Bradley**

Faculty Mentor: Dr. Jane Greer

Academic Unit/Department: English

Funding: n/a

### **Don't Poke the Bear: The Impact of Language on the Safety of Our National Parks' Most Misunderstood Animal**

There is a reason our National Parks are regarded as 'America's Best Idea'- a chance to catch a glimpse into the untouched land, roamed by wildlife with no bounds. But, there is another side to these parks- the dangers presented when visitors enter the park. Of the United States' 63 National Parks almost a third of them host at least one species of the three bears that inhabit North America: grizzlies, black bears and polar bears. The safety of these bears relies heavily on those who handle them and their habitats. This delicate dynamic makes understanding how to behave while in their habitats crucial to them keeping them wild.

I am seeking to understand how the National Park Service (NPS) communicates this delicate balance between man and wild and how their specific language should educate and impact those who may visit these remote lands. I have assessed three articles published by the NPS that discuss the best practices to avoid bear encounters and how to behave if an encounter does occur. With so much riding on how they present this information, it is crucial that they use comprehensible language that does not sugar-coat the dangers bear encounters may hold. They present this information in ways that cater to all visitors in a very clear manner in an attempt to close the disconnect between how bears should be handled by visitors, versus how they are periodically mishandled.

It is today's social media craze that seems to push some visitors beyond the proper boundaries to try to get the perfect picture or once-in-a-lifetime video of a young grizzly or a black bear and her three cubs. Other visitors simply aren't aware of the dangers that bears present to them and the danger they present to bears. Whether visitors are being driven by desire to go viral or innocent ignorance, the need for accessible, comprehensible language is vital to keeping both bears and visitors safe. Humans are merely visitors into the homes of these large, misunderstood creatures, and understanding how best to communicate with these visitors will determine the future of both future visitors and the bears themselves. It is the task of the nps to use proper language to communicate their knowledge of bears and bear-human encounters to keep visitors and the limited bear populations of the United States alive.

## **McKenna Cape**

Faculty Mentor: Dr. Jane Greer

Academic Unit/Department: English

Funding: n/a

### **A Dope Discourse: How USA Swimming Paints the Picture of the Perfect Athlete**

It is common practice for big corporations to network to other institutions for their rules and policies. That is precisely what USA Swimming has done with its anti-doping policies for athletes. Over the past several years, doping, or the use of performance-enhancing drugs, has become a very prevalent issue in Olympic Swimming. My goal with this research project is to examine the language used in USA Swimming anti-doping policies to connect how the language used creates USA Swimming's idea of the "perfect athlete." I will do this by completing a discourse analysis over both the language in the USA Swimming Handbook of 2021 and the policies they network out to. These other institutions include FINA, the USADA, and the World Doping Agency, all of which have their own policies, regulations, and rules concerning the doping crisis. As I completed my discourse analysis, I concluded that USA Swimming did not write any of its policies; all of its regulations were those of other corporations such as the World Anti-Doping Agency and the USADA. By networking out to other institutions for their policies, USA Swimming can give up the responsibility of creating the idea of the "perfect athlete" and can shift the blame, per se, to these larger corporations. My analysis revealed that the language used in these policies is harsh, to the point, and only concerned with rules and regulations, giving off the impression that USA Swimming cares only about Olympic Swimmers following the rules but does not have much concern for their health and safety. It has no intentions of creating a safe, friendly environment for its swimmers; the only goal is to set strict rules to create a fair environment. While fairness is vital, I believe that building a relationship of trust and respect within an institution such as USA Swimming, responsible for the regulations for a very respected Olympic Sport, is just as important. The doping crisis could be better managed if USA Swimming was more concerned with the health and safety of the swimmers instead of cracking down on policies that it did not even want the responsibility of creating to begin with.

**Heidi Carmoney**

Faculty Mentor: Dr. Jane Greer

Academic Unit/Department: English

Funding: n/a

## **Diabetes Speak: A Rhetorical Study of Television Advertisements for Diabetes Medication**

Diabetes is a disease that affects many different people of all races in the United States. The number of people that have diabetes is still rapidly growing throughout the country. According to the World Health Authority, diabetes now affects 4.6% of adults over the age of 20, reaching 30% in adults over the age of 35 (Tattersall). Diabetes is one of the most serious widespread diseases that affects people, but there is very little communication to people with diabetes and their supporters regarding the medical equipment they require. Many diabetics, whether they are newly diagnosed or have been dealing with diabetes for a while, need communication regarding the devices that diabetes requires in order to continue their lifestyle without having to worry about their disease constantly. This form of communication is very important that needs to be talked about, but writers in the field of writing and rhetoric have not examined it yet. Scholars in the field of writing and rhetoric have examined areas of healthcare communication, from anorexia, nutrition, medical illustrations, anatomical drawings, etc, but have not examined the communication of diabetes through the use of advertisements. As a rhetorical analysis, this study examines how information about diabetes is communicated through four advertisements of the most commonly used medications and tools for diabetes patients- for Dexcom, Trulicity, Vidant Health, and Liberty Medical. I argue that the advertisements for these brands do not focus on the important factors such as diet, activity, and exercise. Instead, these companies are focused on making a profit by having their advertisements focus on selling the prescribed medication or medical device that they want to advertise. This study aims to promote further research on the communication of medications and devices, as well as additional research on how diabetic patients respond to the communication of this disease.

## Eric Clarke

Faculty Mentor: Dr. Jane Greer

Academic Unit/Department: English

Funding: n/a

### **The Paper War, A Rhetorical Comparative Analysis of Propaganda Posters from Great Britain and The German Empire During World War I**

Most scholarly works on World War I propaganda look at the nations large scale encompassing everything from radio to films to posters. The few articles that have dealt exclusively with propaganda posters usually focused on a single nation's propaganda. While those few papers that did compare the propaganda effort's of different nations tended to look at what was different between the two nations propaganda efforts. In contrast, this study is a rhetorical and comparative analysis of four German and four British propaganda posters from World War I collected from the archives of The Imperial War Museum, The Met, and The Harry Ransom Center at The University of Texas at Austin. Analysis of these posters shows that both empires shared three goals with regard to propaganda: to sanctify their own soldiers, to vilify the enemy, and to justify their participation in the war. Both British and German propagandists used similar tactics to accomplish these goals including the use of color to influence emotions, imagery to inspire fear or hope, and short memorable phrases to promote patriotism and enlist participation. Understanding how propaganda was used in the past to convince citizens to support the war effort can show the tactics that governments and organizations can use today to influence public opinion.



## **India Collins**

Faculty Mentor: Dr. Jane Greer

Academic Unit/Department: English

Funding: n/a

### **Rhetorical Storytelling in the Legal Field**

As a black female who is an aspiring lawyer, I am very interested to read and analyze Patricia Williams work on racial issues and critical race theory through rhetorical storytelling. As a black individual I have seen and personally experienced racism, and seeing a black woman in a place of power speaking on these issues has inspired me to research more about her and how her story is communicated. Patricia Williams is a black lawyer who has experienced racism in her career and in her day-to-day life. I want to make others aware of the meaning behind rhetorical storytelling and the characteristics of it. I am analyzing the essay "The death of the profane" from the book "The Alchemy of Race and Rights". I will be analyzing this essay through rhetorical analysis to identify when rhetorical storytelling is being used and how to identify it. I will also explain the effects of Patricia Williams telling her story. Throughout my research I have found patterns between the words Patricia Williams used and the type of tone she sets for her audience when she is telling stories. There has been a lot of studies on storytelling through popular media, but very little done on individuals in the legal field. There is so much more to be told from this perspective. There is a specific way Patricia Williams talked about her story that I found intriguing and how it really speaks to her audience. There is more left to be explored about how this affects her in the legal field.

## **Sasha Dellenbaugh**

Faculty Mentor: Dr. Jane Greer

Academic Unit/Department: English

Funding: n/a

### **“The Connection is You”: Understanding the Use of Empathetic Rhetoric Towards the Autism Community**

Autism spectrum disorder (ASD) is a well-known developmental condition that has major impacts on individual's quality of life. Three of its signature impacts are on a person's social skills, their communication, and their ability to form relationships with others. Due to these impacts, a person with ASD may find that they have some trouble when it comes to their quality of life. To try to help with easing these troubles, different organizations were created and dedicated themselves to promoting awareness of ASD. One of these organizations is the Autism Society.

The Autism Society was founded in 1965 by Bernard Rimland, Ph.D. and grew into a large grassroots organization that claims to be a leading source of information and support for individuals with ASD and their families. Their mission is to help people in the Autism community create connections and feel empowered by providing resources to ensure a greater quality of life. There is a vast variety in resources that they provide on their website, but they all are designed to inform people in the Autism community on how to be better equipped to handle the struggles of having ASD. The Autism Society also strongly demonstrates empathetic rhetoric in a variety of ways throughout their website.

In this study, a rhetorical analysis was conducted to examine the rhetoric of the Autism Society on different pages of their website to find out what specific characteristics make it empathetic. It was found that its rhetoric provides empathetic messages that can be grouped into three main categories. The first category emphasizes the uniqueness within a person with ASD. The second category provides the message on how a person with ASD is valuable and deserves respect. The final category focuses on ensuring that those within the Autism community feel understood and heard. All these categories are shown to have the purpose of elevating the self-image of those with ASD and help guide them to understanding that they deserve the best possible quality of life. This purpose is coupled with a plethora of evidence-based resources on their website that are designed to help those with ASD take action towards reaching their best quality of life.

This study aims to promote further research on how to create empathetic rhetoric and how it can be utilized. This research can be useful for more than understanding empathetic rhetoric as it is directed towards audiences like the Autism community. It can also help researchers understand how it can be directed towards different target audiences. Another step in this progression of research could be studying the nuances of how empathetic rhetoric is applied to different groups.



## **Victoria Dominguez**

Faculty Mentor: Dr. Viviana Grieco

Academic Unit/Department: Spanish & History

Funding Source: Emerging Research Scholars

### **Student Life Through the Art of Luis Quintanilla: A Study of the Murals in Haag Hall**

In 1941, Clarence Decker, President of the University of Kansas City (UKC, today UMKC) between 1938 -1953, offered Luis Quintanilla (1893-1978), a Spanish artist who mastered the Italian fresco painting technique, a position as a resident professor. Quintanilla lived through the World Wars and the Spanish Civil War (1936-1939). He opposed the dictatorship of Francisco Franco and lived in exile in New York City until the 1950s. Then, he relocated to France and returned to Spain in 1976 (after Franco's death) where he resided until his own death in 1978. Counting on the support of the Emergency Committee in Aid of Displaced Foreign Scholars (which was established to aid scientists and academics fleeing from Nazi Germany), Dr. Decker invited Quintanilla to UKC to establish the first fresco painting school in the United States. While painting murals on the walls of the Liberal Arts Hall (present-day Haag Hall), Quintanilla was given the opportunity to train apprentices and engage with the students who served as models. My research focuses on Dr. Decker's efforts at broadening the academic scope of the university by appointing prominent international figures to the faculty. Additionally, it explores how the university engaged with students beyond the classroom. Finally, it studies the institutional and financial support UKC received from the Emergency Committee and other organizations that aided American universities interested in hiring displaced scholars. For advancing this project, I read and analyzed original primary sources housed at UMKC's archives, UMKC's LaBudde Special Collections, The Rockefeller Foundation, and the New York City Public Library. I consulted Dr. Decker's correspondence, UKC's yearbooks, the records of the Committee in Aid of Displaced Foreign Scholars, and Rockefeller Foundation's Annual Reports, Articles from the Kansas City Star covering the progress of the murals as well as New York Times articles concerning foreign scholars were accessed online. My research is relevant to Missourians as it shows how higher-education institutions promote cultural engagement through students' activities within and outside the classroom. While they were painted, Quintanilla's murals were noted by the press and the local community. However, over time, they received less attention. I hope that my work helps these murals become noted beyond the walls of Haag Hall.

## **Gabi Exendine**

Faculty Mentor: Dr. Jane Greer

Academic Unit/Department: English

Funding: n/a

### **A Genre Analysis of Bedroom Pop, and How it Defines and Influences the Lyrical Writing Process of Clairo**

Clairo is a 23-year-old female musician from Massachusetts, who uses songwriting as a personal diary, and a way to document her personal experiences. This genre of music is described as bedroom pop, which is a term that was coined in the mid 2010's. The bedroom pop genre was heavily influenced by Clairo's work, by setting common themes such as relationships, identity, and personal experiences. This genre is also popular for its relatability. Clairo's composition process is very unique to herself because of the personal topics she chooses to write about. Because she started her music career as a bedroom pop artist she is defined by that genre, and talks about how she feels like she needs to mold her work to fit those expectations. One thing that I have found is that because she writes about personal experiences, she also alludes to other popular works in her writing. Of course this is not completely unique to bedroom pop, but this sets it apart from many other genres. Bedroom pop is a growing genre of music because of how personal and DIY it can be. I will be conducting a genre analysis to find how the bedroom pop genre defines Clairo's work as an artist. I will also be looking at how modern pop music contrasts with bedroom pop because of the creative process behind it. To do this I will be analyzing two interviews with Clairo. She was invited to participate in two interviews with Genius relating to two of her songs. Genius is a media company that provides song lyrics along with annotations and interpretations. They also hold interviews with musicians where an artist is invited to sing their song line by line and go into depth on the writing process behind their song. The first GENIUS interview with Clairo is about her song titled "4EVER," and the second interview was a year later, about her song titled "bags." In these interviews Clairo talks about how she is viewed as a bedroom pop artist, and how that affects her writing process by constraining her to a specific genre. I used these two interviews to analyze how she views her own process of writing. Using an article written by Felicity Baker titled "What about the Music? Music Therapists' Perspectives on the Role of Music in the Therapeutic Songwriting Process," I compared Clairo's writing process to how songwriting is used as a form of therapy, and analyzed how Clairo does this in her own work.

## **Addison Ferren**

Faculty Mentor: Dr. Jane Greer

Academic Unit/Department: English

Funding: n/a

### **The American Media's Shift from Sensationalism to Scolding of China's One Child Policy**

The one child policy was in place in China from 1979 until 2015 when it was formally repealed. The policy was originally instituted as the population climbed towards and over one billion people. The policy stated that each family could only have one child otherwise there would be fines and possibly even forced sterilization. It not only impacted a whole generation but it also impacted how America views China even today. During both the beginning and end of the policy, American media reported on their own findings and generalizations. By looking at how the American media portrayed China's one child policy in both 1979 and again in 2015 by looking at the rhetoric used in both periods, I was able to find several instances where the policy and Chinese people were sensationalized by the American media. This not only shaped the American people's view about the Chinese government but also about the Chinese people.

In the beginning of the policy, in 1979, the United States media heavily sensationalized the policy by not only pointing out the bizarreness of the policy but also how contraception techniques used by the Chinese were also bizarre and weird from the Western world's point of view. To the Western world, having contraception and abortions readily available to the public was something the media considered to be unheard of. In 2015, after the policy was repealed, the media put forth by the New York Times shifted to a scolding tone. In many of the articles, the failures of China's policy are heavily cited as well as how China's loneliest generation was created as a result of this policy. In the article by Fuqin Liu, he and others look at how China and its people responded to the policy ending in 2015. Yoshihiko Kadoya and others look at how the policy affected group cooperation specifically in China. The policy's effects both on China and its people have been thoroughly studied by many other researchers and countries. What I am doing is looking at how the United States media reported on the policy and how they conveyed it to the American people. I did this by pulling articles from the New York Times from both 1979 and 2015 to look at how the policy was conveyed to the American people both when it was instituted and when it was repealed. By doing this, I was able to see the different rhetorical devices that the United States media used to sensationalize the policy to the American people as well as how they progressed in 2015 to scolding China for the institution of the policy.

**Carmen Gudino**

Faculty Mentor: Dr. Jane Greer

Academic Unit/Department: English

Funding: n/a

**Bilingualism: Benefit or Burden?**

For my research, I interviewed two bilingual immigrant students who are in college. I chose two different college students who are bilingual for the reason being that these two students understand what the struggles of learning two languages at the same time is. They have experienced first hand what it is like to enter a setting where they are a complete stranger and where they don't understand certain things, or anything at all. I chose to conduct interviews because I felt this would give me and the audience a better sense of understanding these students as well and give us a personal connection in order to truly recognize the effort it takes for them to succeed. Conducting interviews allowed me to understand their journey as students, but also take a look at how their “gift” of bilingualism can actually be a burden to them in different aspects, mostly in writing. I also took a look at a couple of different journal articles that also look at how bilingualism may affect other aspects of a person's life. After interviewing college students, I’ve found that those who grow up speaking two languages [bilingual] are often put in a harder position when it comes to writing, in the sense that they often struggle to truly comprehend and express what they want to say because of how their mind thinks in two different languages.

## **Sylvia Jeffress**

Faculty Mentor: Dr. David Trowbridge

Academic Unit/Department: History

Funding: Emerging Research Scholars/Undergraduate Research Associate

### **The Evolution of Healthcare in Kansas City**

Kansas City has been thriving for well over a century, from its beginning in 1853, to the current day in 2022. One thing that has evolved almost more than anything is the hospitals and healthcare within the city. With the very first established hospital being *General Hospital*, which pathed the way for all the medical centers we have today in Kansas City.

Going through each hospital I was able to take record of this presentation will introduce and inform the history of hospitals and the healthcare they provided or still provide to Kansas Citians.

With the help of *The Clio*, and *The Missouri Valley Special Collections*. I was able to gather and present these hospitals. *The Clio* was where I placed all the entries I worked on while *The Missouri Valley Special Collections* was where I received most of my sources. Using both these main sources this presentation was possible.

Kansas City has had multiple hospitals but the ones being showcased today are *General Hospital*, *Saint Luke's Medical Center*, *Saint Joseph's Medical Center*, and *University Health*. Each of these hospitals have made their mark in Kansas City, ranging from being the first established hospital, to being one of the oldest still running. Also being presented is the tour that was made on *The Clio*, to showcase the hospitals in Kansas City, Missouri.

**Emma Leonard**

Faculty Mentor: Dr. Diane Mutti-Burke

Academic Unit/Department: History, Honors Program

Funding: n/a

## **Sports and Gender: A Comparative Historical Analysis of Men's and Women's Sports in the United States**

Amateur and professional sports are a massive part of American society, generating revenue of an average of \$70 billion per year. Despite their large prevalence, this massive industry represents the gender discrepancies in American history. Men's sports are more popular than women's sports; a trend demonstrated throughout the last century in the United States. Men's sports receive more media attention, are more accessible, and generate much more revenue than women's sports. The purpose of this study is to provide historical context about the vast economic discrepancies between men's and women's sports in the United States and identify some reasons for why these differences exist. Key events such as the women's suffrage movement and the passage of Title IX guide the advancements of women's rights and their prevalence in sports. A self-conducted survey also demonstrates a sample of Americans' attitudes to men's and women's sports today. Overall women's sports are less prevalent in the United States as compared to men's sports due to various historical disadvantages and modern-day discrepancies.

**Jacob Lobdell**

Faculty Mentor: Dr. Jane Greer

Academic Unit/Department: English

Funding: n/a

**Exploring the Rhetorical Discourse of Therapy Sessions  
Through the Examination of an Interview with a Practicing Therapist**

Through analyzing an interview with a practicing therapist I will explore different facets of rhetoric in therapy sessions and how it affects the communication that occurs, such as the use of ethos, pathos, and logos, and the therapeutic alliance between client and therapist. With this comes the idea of trust and client confidentiality. This is what makes a therapeutic alliance a unique relationship. Therapists specialize in analyzing and communicating with all sorts of clients. They have numerous tools at their disposal that they use consciously and unconsciously to get all the information they can and process everything they have gathered. With the application of their experience and knowledge base, they are able to improve the mental health of others. There has been no mention of therapy in the *Young Scholars in Writing* and I think that the addition to the research community will be of benefit to strengthen and improve what's already there. The idea of therapy is becoming more mainstream, although there is still a lot of area for improvement. With all the stigmatism around therapy and even the idea of mental health in general. This topic is very close to my heart and something I am very passionate about. Mental health in college is getting a little bit of the spotlight it deserves, but that is only because of the cases that were found too late. It should never get to this point and all people should be given all the quality resources that they need.

## **Maggie Maenner**

Faculty Mentor: Dr. Jane Greer

Academic Unit/Department: English

Funding: n/a

### **Gender-Based Microaggressions in the Film Industry: as Seen in Jimmy Kimmel Interviews**

This study seeks to investigate the use of microaggressions based on gender in specific settings within the film industry. My research includes explanations on what microaggressions are and how they are used. I have also investigated discrimination and sexism within the film industry, primarily from behind the scenes and behind the camera. My sources discuss how these conditions affect the women who work in the film industry. But for a real-world example of these microaggressions in action, I have chosen to focus on two interviews from the celebrity talk show, *Jimmy Kimmel Live!*, one with a male filmmaker and the other with a female filmmaker. This is in order to have a direct comparison between the interviews, to better decide what qualifies as a “gender-based microaggression”. I selected Kimmel’s interview with *Little Women* director, Greta Gerwig, and his interview with Tyler Perry; the director and creator of the *Madea* series.

During my study, I compared the two interviews with Perry and Gerwig using Discourse Analysis. In doing so, I identified two separate sources of microaggressions present in Gerwig’s interview with Kimmel. The first source is the questions that he asked Gerwig. They are entirely different from the questions that were asked to Perry. My second source of microaggressions from these interviews is the tone and physical behavior of the host. During Gerwig’s interview, Kimmel talks in a softer tone of voice, and keeps his movement and hand gestures minimal. He treats Gerwig gently, like a wild animal he’s afraid to spook. But for Perry’s interview, Kimmel is far bolder. He makes jokes and uses expansive, emotional hand gestures. Compared to Gerwig, this behavior is far more aggressive and bold. I will explain each of these instances of microaggressions in much more depth in my paper and at the Symposium. I hope to draw viewer’s attention to these patterns of behavior and for them to leave understanding that these small actions are no small problem.



**Makayla Mead**

Faculty Mentor: Dr. Jane Greer

Academic Unit/Department: English

Funding source (if any): n/a

## **Healthcare Communication During Pandemics: Reaching Specific Audiences**

We are currently living in a global pandemic. There are many ways to prevent and lower the spread of the virus, such as wearing masks and getting the vaccine. However, the number of COVID-19 vaccine recipients in the United States has shown the lack of effectiveness in this healthcare communication to the public. The purpose of this research study is to analyze the different approaches used to appeal to specific targeted audiences during a pandemic. I achieved this by examining the different patterns and trends of communication in HIV/AIDS brochures targeted toward homosexual men and women during the time of the healthcare crisis. I performed a rhetorical analysis to investigate these techniques used to appeal to the affected individuals of the HIV/AIDS pandemic. After completing this analysis, I have observed the different language and information utilized to appeal to the different audiences. For homosexual men, a more logos approach was used due to being one of the main groups increasingly affected by the virus. This included information on what HIV/AIDS is, how it spreads, and how to prevent this spread while still allowing a sex life. For homosexual women, there tended to be a more pathos approach in addition to all of the statistics and safe sex information. Homosexual women weren't as affected by HIV and AIDS as homosexual men were. The pamphlets ensured these women that they, too, should care and worry about the HIV/AIDS pandemic. There was information about pregnancy and the gay community to appeal to emotion, rather than just using a logos approach. This research study on the rhetorical analysis of HIV/AIDS brochures is important and relevant today with the issues we are experiencing during a new pandemic. The hope is to be able to use this information from this study to communicate more effectively to different audiences during the COVID-19 pandemic.

## **Brenden Mosher**

Faculty Mentor: Dr. Jane Greer

Academic Unit/Department: English

Funding: n/a

### **How the Industry Restricts Art: Liberation from Commodification in Frank Ocean's *Blonde***

Following the 2016 release of Frank Ocean's *Blonde*, many artists expressed their growing concern with the industries commodification of their art. Impossible deadlines and unfair restrictions to the art a musician can produce has led to an overwhelming battle of quantity vs. quality. As a result, artists are forced to rush material, creating unfinished, inauthentic bodies of work. This has directly correlated to a loss in sales and popularity in many artists, forcing musicians to become independent, losing the support of a label for the luxury of creative freedom. One artist who has spearheaded the fight against commodification in the modern music industry is R&B/Pop singer, Frank Ocean.

After analyzing Ocean's composition process and use of language I decided to conduct a textual and discourse analysis focusing on how modern artists use their rhetoric to combat how the media constructs notions of celebrity. By examining Ocean's junior studio album *blonde*, as well as interviews and release notes surrounding the aforementioned albums release, I was able to understand how musicians use compelling pathos and vivid imagery to provide a relatable emotional commentary. This is an endearing technique used by artists such as Ocean to build authenticity in their art, which in turn helps break down the commodification and profitability imposed on them by the business structure of the music industry.

By research and study of various rhetorical techniques, as well as how artists communicate with the public, I was able to demonstrate how modern musicians work to dismantle the restrictions placed upon them by an industry out for profit. Through various literary techniques, credibility is built through maintaining authenticity and individual creativity, allowing for art that can be appreciated and related to a wider audience. I hope this research allows others to better understand the struggles and influence of artists whose art we digest on a daily basis, creating a better appreciation for those who put all of themselves into their work.

## **Thecla Okwara**

Faculty Mentor: Dr. Jane Greer

Academic Unit/Department: English

Funding: n/a

### **Virtual Therapy Website / In-person Therapy Website: What Works Best for You**

People with mental health issues or disorders have always had problems when it comes to deciding what kind of treatment is good for them or works better for them. The era of online treatments such as therapy seems to have evolved over the years as many virtual therapy websites have surfaced making therapy more assessable for people. Each website has different contents on how they present themselves to the public. During online therapy, people still consider in-person therapy, which is the oldest and most common form of therapy. For this research study, I will be analyzing two websites: virtual therapy website and in-person therapy website and see how they appeal or persuade people based on the contexts of the websites. Mental illness is not just anxiety and depression. There are other forms of mental illnesses such as Bipolar Disorder, PTSD, Social Anxiety, OCD, Panic Disorder, Borderline Personality Disorder and so on. Each website gives a good list of them showing that anyone dealing with any form of mental illness is welcomed for treatments. This research also considers the environment of these websites as to if they are safe enough as therapy is all about the safety and comfort of the patients when it comes to the offices of in-person therapy session and virtual therapy sessions via internet. Diversity in therapists has also been a key factor to patients when it comes to looking for therapists of color. For these findings, I will be doing additional research by looking at more websites to see which form of therapy has more widespread patterns, for example which form of therapy is assessable to some demographic areas and income and age range.

**Emma Rucker**

Faculty Mentor: Dr. Jane Greer

Academic Unit/Department: English

Funding: n/a

## **Prisoner Apology Letters as a Way of Redemption and Rehabilitation in the Restorative Justice Process**

Multiple studies have been done on writing as a tool for expression as well as research on apologies used for the restorative justice process but there is little research on prisoners using apology letters as a way for redemption and rehabilitation. In this research, a rhetorical analysis is done on three apology letters from the American Prison Writing Archives from Hamilton College. These letters contain apologetic language that show remorse towards those they have hurt. The goal is to explore the language prisoners use in their writing to express interest in redemption. This research will contain background information on what a respectable apology contains and the importance of restorative justice for both victims and offenders. Restorative justice creates a safe place for victims, offenders, and others affected by the crime to have a meaningful conversation about the situation. This process also encourages the offender to take accountability and sincerely apologize. This will show that apology letters can be beneficial for prisoners to gain redemption and enter the rehabilitation process. Acceptance and remorse is important in order to rehabilitate into society. This research will be beneficial in the rehabilitation process as criminals wish to make it right towards society for their actions.

**Adreanna Starnes**

Faculty Mentor: Dr. Jane Greer

Academic Unit/Department: English

Funding: n/a

**Continuing The Conversation:  
A Deeper Look into the Rhetoric of Mental Health Resources**

The conversation around mental health has not always been welcomed, or widely spread, like it is today. Although resources are expansive, throughout this study it has shown that the language used around mental health still has room to grow and is ever changing to create safe, specific, and accurate resources for various audiences. I have used a rhetorical analysis of the National Institute of Mental Health's website to create this research project to dissect and understand the language used for special populations, deemed by the website, and to shine a light on the importance of remembering the audience your writings are geared towards. I will explain the possible damaging aspect of generalized mental health information and shine a light on how major mental health resources don't vary the language used for specific audiences. In order to continue the conversation around mental health, I will emphasize how mental health language is not a one size fits all and how it needs to be specific for each special population.

# **BEHAVIORAL & SOCIAL SCIENCES**

**Maya Baughn, Niveen Al-Saoudi, & Macy Hornosky**

Faculty Mentor: Dr. Amanda Grimes

Academic Unit/Department: School of Nursing and Health Studies

Funding: SEARCH

### **Perception of the COVID-19 Vaccine among Missourians aged 15-21 Years Old**

**Background:** As the COVID-19 pandemic continues to disrupt social aspects of society, vaccine availability promises the return to normal social activities for many populations. Currently, vaccination rates for the state of Missouri remain lower than the national average and are disproportionately low in minority populations. For Missouri adolescents aged 12-17, about 44% are fully vaccinated compared to the national rate of 59% and for those aged 18-64, 60% are fully vaccinated compared to the national average of 72%. Therefore, the purpose of this study is to explore the hesitancies of urban teens toward getting the COVID-19 vaccine.

**Methods:** The study team conducted three focus groups via zoom and one in person at Guadeloupe Centers High School, each with between 6 and 9 participants. Demographics were self-reported via survey. Focus groups began with COVID-19 related poll questions as ice breakers. Participants were then asked about barriers to the COVID-19 vaccine. Focus group discussions were audio recorded and transcribed then analyzed for themes in NVivo version 12.

**Results:** The study population was majority male (85.7%, n=24), Black/African American (71.4%, n=20), and reported to be fully vaccinated for COVID-19 (64.3%, n=18). Findings from the poll questions revealed that 92.6% said they received information about the COVID-19 vaccine from social media. Nearly 74% of participants identified feelings of hesitancy before getting vaccinated. Three major themes emerged from the conversation about COVID-19 vaccine hesitancy: 1) protection and prevention from the vaccine, 2) the influence of family on the decision to be vaccinated, and 3) the trustworthiness of information about the COVID-19 vaccine.

**Conclusion:** Learning about the barriers to getting the COVID-19 vaccine for urban youth and young adults can help inform targeted public health promotion of the COVID-19 vaccine. Interventions should focus on teaching teens and young adults how to find trustworthy information about the vaccines, how to evaluate COVID-19 information on social media, and how to talk to family members about the vaccine.

## **Zalyia Carr**

Faculty Mentor: Dr. Erin Hambrick

Academic Unit/Department: Psychology

Funding: n/a

### **Diagnoses Differences of Childhood Mental Disorders Among Black Women**

**Introduction:** In both mental and physical health, it is well known that early detection and treatment of problems is best. This is especially true when diagnosing and treating childhood mental disorders (Fineburg, 2019). Some common childhood mental disorders are Autism, ADHD, OCD, and Specific Learning Disorders. While these are normally diagnosed in early childhood or adolescence, rates of early diagnosis likely differ amongst the demographics. For example, Autism and ADHD are more likely to be diagnosed in boys. This is not because there are fewer girls with ADHD and Autism in the world, but because symptoms display differently in girls making it harder to detect (Wood-Downie, 2021). Black children have lower rates of diagnosis for ADHD than White children even though symptoms appear at similar rates (Coker, 2016). Black children are more often diagnosed with disorders such as Oppositional Defiant Disorder and Conduct Disorder than their White counterparts (Fadus, 2019). Studies that analyze signs and symptoms of these disorders aren't diverse. Participants in these studies typically come from the western culture which prevents researchers from accounting for global differences. In studies that do ask for race, the participants are majority White even if the population includes multiple races. Studies are more likely to not ask for race, which prevents researchers from identifying and analyzing potential trends among races (Qu, 2020). Because of these factors, I hypothesize that Black women/ girls are at higher risk for delayed accurate diagnosis of mental health problems that typically first appear during childhood. I also hypothesize that treatment rates amongst Black women with diagnoses will be lower than that of White women.

**Proposed Method:** Through a survey that I will develop over the next few months consisting of multiple choice and free response questions, I will examine diagnosis rates of Autism, ADHD, Specific Learning Disorders, and OCD amongst college-aged Black women and other college-aged women, with a specific focus on whether diagnosis rates differ between Black and White women. In addition, I will examine age at the time of diagnosis to determine if Black women receive diagnoses later in life than White women. I will also ask about what type, if any, treatment the participants have received.

**Potential Implications:** A commonly discussed phenomenon is that Black women's health issues are not identified and treated as early as health issues experienced by White women. This has led to significant safety concerns in many fields such as prenatal health. This study will be one of the first to evaluate such a lack of identification and timely treatment of mental health problems typically diagnosed in childhood in both Black and White college-age students. This study is important because many childhood mental health disorders are treated with medication and/or clinical therapy. Without a diagnosis, neither treatment option can be accessed. Delayed treatment can cause long-lasting problems; there's an increased risk for mortality, developing comorbidities, and negative effects on things such as relationships and employment (McLaughlin, 2004). If Black women are more likely to be underdiagnosed and untreated, they risk being put at a disadvantage in other aspects of life.



**Karah Chappel**

Faculty Mentor: Dr. Dawn Iwamasa, MT-BC, CCLS

Academic Unit/Department: Conservatory

Funding: n/a

**Exploration of the Education and Experiences  
of Music Therapists in Trauma Care**

Traumatization occurs when both internal and external resources are inadequate to cope with an external threat, either real or perceived. While the impacts may not be immediately visible, trauma affects long term health outcomes, mental well-being, and relationship skills. The root trauma and its symptoms can be addressed through counseling, social work, pharmaceuticals, and music therapy, among other modalities. Research surrounding the use of music therapy to treat clients who have trauma as a primary reason for referral or trauma recovery as a primary treatment goal shows that music therapy has a significant positive effect on treatment outcomes. Some research exists around music therapist's perspectives in trauma work, but little is known about what specialized training or experiences music therapists undergo beyond board certification, if any, prior to working in trauma care.

This study elucidates perspectives and experiences of music therapists who self-identified as working with clients who have trauma as a primary reason for referral or trauma recovery as a primary treatment goal. Data was collected via a survey and semi-structured interviews then coded and analyzed. Areas such as level of collegiate education, additional formal and informal training, preparedness after board certification, common goals, and necessary skills are investigated. Themes of higher education and interdisciplinary collaboration are discussed. Recommendations are made for improving music therapy education to equip music therapists for work in this area. Limitations and further research considerations are noted.

**Cristina Chavez-Arnst**

Faculty Mentor: Dr. Mona Lyne

Academic Unit/Department: Political Science

Funding: SEARCH

## **Was South Africa a Democracy Under Nelson Mandela?**

Many scholars expected that South Africa would develop into a pluralist democracy following the end of the Apartheid regime and the ascension of the African National Congress (ANC) to government. Yet, despite its diverse society and permissive institutions, South Africa has not developed into a pluralist system. I argue that the ANC has monopolized political institutions as well as civil society. I look closely at civil society organizations and how they have been treated prior to and following the ANC's ascension to government, as well as how political representation evolved during the transition, and to what extent opposition influences outcomes. I find that while the institutions are structured in a way that should promote pluralist democracy, with the ANC's dominance, pluralism is limited at all levels of government and within civil society.

## **Ian Coffman**

Faculty Mentor: Dr. Amanda Grimes

Academic Unit/Department: School of Nursing and Health Studies

Funding: n/a

### **Getting Around KC**

**Background:** An individual's health and life expectancy are strongly associated with where a person lives. For example, there is nearly a 17-year difference in life expectancy in the highest and lowest life expectancy ZIP codes in Kansas City, MO. Health being multi-faceted is influenced by one's built environment and public infrastructure. Previous research in other cities has found that public transit use is associated with increased physical activity. However, little is known about the factors that may influence this relationship, particularly for individuals living in Kansas City's ZIP codes with the lowest life expectancy. Therefore, the purpose of this study is to examine the relationship among variables that may influence bus use, and physical activity.

**Method:** Participants (n=96) were surveyed at five bus stops located in the lowest life expectancy zip codes in KCMO by undergraduate students enrolled in an introductory public health course at UMKC. Participants were asked questions regarding demographics, physical activity, as well as access and usage of public transportation. Physical activity was collected using the International Physical Activity Questionnaire. Univariate statistics were performed on all demographic variables; a Pearson Correlation was used to determine if there were any relationships between physical activity and variables such as public transportation or demographics.

**Results:** The mean age of participants was 42 years old, with the majority of participants reporting as male and non-white. The most reported household income was \$15,000 or less per year. Participants were frequent bus users reporting using the bus on average 20 out of the prior 30 days. Those who reported to use the bus most frequently reported using the bus with activities not associated with physical activity. Bus use to the park and those who lived further away from the bus stop reported higher rates of physical activity.

**Discussion and Conclusion:** For KC residents living in low-life expectancy zip codes, the bus remains an important source of transportation. Our findings suggest that bus use may only increase physical activity levels for those who live further from bus stops or for those who use the bus to visit parks. In ZIP codes with the lowest life expectancy prioritizing parks could allow for healthier lifestyle choices and more physical activity.

## Sophia Couteranis

Faculty Mentor: Dr. Oh-Ryeong Ha

Academic Unit/Department: Psychology

Funding: SEARCH

### The Effect of Parent and Sibling Relationships on Prosocial Behavior in Young Adults

**Introduction:** Prosocial behavior has benefits for those receiving help and those helping, such as better physical health and psychological well-being (Poulin & Holman, 2013). For this reason, deepening our understanding of how prosocial behavior develops throughout the lifespan is essential. Foundations for prosociality would be formed in the context of family. Social learning theory suggests that parents model prosocial behavior for their children by behaving in warm, sensitive, and non-rejecting ways toward them and others (Putnick, et al., 2019). Sibling relationships also play an important role in psychosocial development (Dirks et al., 2015; Pike et al., 2006; Soysal, 2016) and decision-making (Morrongiello & Bradley, 1997). One study reported that positive sibling relationship was more associated with prosocial behavior, whereas negative sibling relationship was more associated with conduct problems in children (Pike & Oliver, 2016). Additionally, individuals' characteristics, such as emotion regulation and self-control are known to influence prosocial behavior (Lockwood et al., 2014; Joosten et al., 2015). I hypothesize that higher parental acceptance, positive sibling relationships, and positive emotional regulation tactics would be related to higher displays of prosocial behavior in young adults. **Methods:** Forty-four participants ages 18-40 years ( $M=22.X$ ) were recruited through UMKC Psych Pool and Amazon MTurk. After consenting, participants completed online surveys via Qualtrics. Participants began by answering a demographics questionnaire, followed by surveys to assess prosocial behavior (Social Values Orientation [van Lange, 1999]), emotional regulation (Emotional Regulation Questionnaire [Gross & John, 2003]), parental acceptance dimensions (Parental Acceptance Rejection Questionnaire [Buri, 1991]), and sibling relationships (Lifespan Sibling Relationship Scale [Riggio, 2000]). Prosocial behavior includes actions that benefit others, often at a cost to oneself (van Lange, 1999). Parental acceptance was measured within several dimensions of acceptance including warm/affection, hostility/aggression, indifference/neglect, and undifferentiated rejection (Buri, 1991). Sibling relationship is defined as overall attitude toward the adult sibling relationship and satisfaction with the relationship. **Results:** Bivariate correlations were conducted to assess hypothesized relationships. Prosocial behavior demonstrated little influence from the father, but several significant relationships between dimensions of mother acceptance and behavior were found. Notably, maternal hostility and aggression was negatively correlated with prosocial behavior ( $r(42) = -.361, p = .016$ ). Little relationship was found between overall sibling relationships and prosociality, however emotions toward sibling and sibling relationships as an adult correlated positively with prosocial behavior ( $r(42) = .301, p = .047$ ). Additionally, a negative correlation was found between emotional suppression and prosocial behavior ( $r(42) = -.395, p = .008$ ) supporting the idea that positive emotional regulation tactics would positively correlate with prosocial behavior. **Discussion:** The findings of this study show that individuals who reported feelings of acceptance from their mother also reported high levels of prosocial behavior. Individuals who reported positive emotions toward a sibling and sibling relationship as an adult also reported high prosocial behavior. The results of this study may imply that the foundation for building prosocial members of society may be laid down during youth in the home.

## **Rachael Fritz**

Faulty Mentor: Dr. Ryan Carpenter

Academic Unit/Department: Psychology

Funding: n/a

### **An Examination of the Impact of the COVID-19 Pandemic on Alcohol Consumption at the College Level**

**Introduction:** The COVID-19 pandemic has resulted in significant unforeseen stress on the population, which has led to some turning to alcohol as a form of coping. Undergraduate students are not exempt from this but rather are an interesting group to look at when it comes to their drinking habits during the pandemic. Recent studies have found that when looking at student alcohol consumption, demographics with students who were in the 25-45 age range increased their drinking compared to those 25 and under (Acuff, S. et al., 2022). Also, students who moved back in with their parents drank less than those who stayed at their pre-COVID-19 dwellings (Acuff, S. et al., 2022). Studies also highlight that students who lost their jobs due to the pandemic drank more than those who did not have a job pre-COVID or worked remotely (Acuff, S. et al., 2022). This is interesting to note because different life stressors could affect how students' fear the COVID-19 pandemic and their desire to drink.

**Methods:** This study focuses on how COVID-19 has impacted undergraduate alcohol use by examining self-reported changes in alcohol consumption and fear of COVID-19 over time, as well as how some demographic factors may impact their consumption. Data were collected from undergraduate students through the psychology subject pool at the University of Missouri, St Louis using an online survey. This study was conducted over the course of three semesters; spring of 2021 (n=57), fall of 2022 (n=47), and spring of 2022 (n=36) to examine undergraduate alcohol consumption as the pandemic continues. Analyses aimed to understand how fear of COVID-19 and alcohol consumption have changed across the course of the pandemic. Frequencies of variables and descriptive statistics were examined. Correlations also examined how fear of COVID-19 and alcohol use disorder were related. This study shows that alcohol Use Disorder (AUD) and fear of COVID-19 were significantly associated ( $r = -.218$ ,  $p < .01$ ) when compared to students who drank 5 or more drinks at one time.

**Results:** Participants were mostly female (78% female, 9.2% male, and 2.1% non-binary) college students. Participants were 7.1% Freshman, 6.4% Sophomore, 44% Junior, 41.8% Senior, and the majority of the sample (64.5%) was White, with 18.4% reporting Black, 3.5% Asian, and 2.8% more than one race. Results found that more students in the spring semesters reported consuming more alcohol since the beginning of the pandemic, (spring 2021: 56.3%, spring 2022: 53.3%) compared to the fall semester (47.7%). Data also supports that both students who feared and did not fear COVID-19 still had difficulty doing normal tasks due to their alcohol consumption.

**Conclusions:** Results will highlight how students are feeling about the COVID-19 pandemic as well as how this has affected alcohol use.

**Amari Holland, Sally Vo, Ben Wilson  
& Weston Womack**

Faculty Mentor: Dr. Greg Vonnahme

Academic Unit/Department: Political Science

Funding: n/a

### **Testing Theories of Civic Engagement in a General Education Course**

In this general education class-based project, we test leading theories of civic engagement using a mixed-methods approach. We focus on two main hypotheses derived from academic work on civic engagement: 1. that it promotes interpersonal trust, and 2. that it strengthens norms of reciprocity. To test these hypotheses, the project includes results from participant-observation, in which each student was required to complete 18 hours of civic engagement and record field notes, survey measures of trust and reciprocity, and measures from behavioral game theory.

## **Hannah Leyva**

Faculty Mentor: Dr. Stephen Christ

Academic Unit/Department: Sociology, Honors Program

Funding: Emerging Research Scholars

### **Understanding Latinx Students at an Urban Research University**

As the enrollment of Latinx students in postsecondary institutions increases, the ability to understand this emerging student population is critical in the advancement of diverse and inclusive campuses. Using T.J. Yosso's model of Cultural Wealth (2005) can serve as a solid foundation for challenging traditional deficit perspectives towards underrepresented students. College is a significant marker in the socioeconomic advancement of the Latinx population and therefore an important focus for those in education who want to support the academic goals of their Latinx community. The purpose of this study is to investigate the relationship between not only the students and their campus, but with their faculty to address a lack of representation in higher education. Surveys were distributed to faculty at an urban research university as well as the residing Latinx students. Questions asked reflected the six types of cultural wealth: aspirational, navigational, social, linguistic, familial, resistance. Both quantitative and qualitative responses were collected to measure each type of cultural capital. Overall, student responses indicated that they were unsure on their role as Latinx students on campus. Faculty responses showed that they are concerned about their cultural competency and are sensitive to any concerns that are directly expressed by students. Although there are discrepancies between student and faculty responses, both parties expressed concern about the efforts their university is making for effective diversity and inclusion. The results of this study do correspond to previous research made surrounding the cultural wealth of Latinx college students.

## Grace Nanney

Faculty Mentor: Dr. Oh-Ryeong Ha

Academic Unit/Department: Psychology

Funding: SEARCH

### Identifying Relationships Between Coping Styles and Eating Behavior

**Objective:** It is widely accepted that stress and emotions lead to changes in eating behavior (Greeno and Wing, 1994; Gately, 1989). Maladaptively coping with stress and emotions has been postulated to negatively impact eating behavior (Martyn-Nemeth et. al., 2008); therefore, identifying adaptive coping strategies that would lead to positive eating behavior changes is an integral path for public health research. Past research has identified two primary coping styles an individual use to deal with stress: problem-focused coping, where one take actions to eliminate stress; and emotion-focused coping, where one tries to regulate emotions to minimize impacts of stress. Our research examined the relationship between problem and emotion-focused coping styles and eating behavior. We hypothesized that individuals in high stress who use high emotion-focused coping would make unhealthier eating behaviors than those who use high problem-focused coping. In addition, we expected that individuals who are overweight and/or obese (i.e. unhealthy weight, Body Mass Index (BMI =  $\text{kg}/\text{m}^2$ ) scores 25 and above) would be more likely to make unhealthy eating behaviors and emotion-focused coping than those with healthy weight. Participants rated foods based on taste, health, preference, and choice using a computerized food-decision rating task (Ha et al., 2016) and completed the Three-Factor Eating Questionnaire (Stunkard & Messick, 1985), a self-report measure concerning factors associated with eating behavior, including Dietary Restraint and Hunger. Participants then completed self-report measures that ascertained their level of perceived stress (Perceived Stress Scale; Cohen et al., 1984); and their preferred coping style (Ways of Coping – Revised; Folkman and Lazarus, 1968). Specifically, the coping styles of self-controlling, a form of problem-focused coping where efforts are taken to regulate one's actions, and escape avoidance, a form of emotion focused coping where one disengages and stays away from a stressful situation and its emotional consequences, were analyzed. **Results:** An ANOVA with unhealthy eating choice as the dependent variable, and preferred coping style, which was either emotion-focused (i.e., escape/avoidance) or problem-focused (i.e., Self-Controlling) as the between-subject factor was conducted. Results found no significant differences in unhealthy eating choices between the two different coping styles,  $F(1,17) = 1.464$ ,  $p=.243$ , partial  $\eta^2=.079$ . An ANOVA with unhealthy eating choice as the dependent variable and weight status (Healthy weight, Unhealthy weight) as the between-subject factor, and another ANOVA with coping style as the dependent variable and weight status as the between-subject factor were conducted: No significant differences in unhealthy eating choices ( $F(1,42)=1.623$ ,  $p=.210$ , partial  $\eta^2=.037$ ), nor in the use of coping style between healthy weight and unhealthy weight individuals ( $F(1,42)=1.121$ ,  $p=.296$ , partial  $\eta^2=.026$ ). Additional correlational analyses were run to assess for relationships between coping style and eating behaviors. Hunger was found to be positively correlated with emotion-focused coping style,  $r(45)=.394$ ,  $p < .01$ , while Dietary Restraint was found to be positively correlated with problem-focused coping style,  $r(45)=.349$ ,  $p = .02$ . **Discussion:** Our research found that individuals who were experiencing hunger used more emotion-focused coping skills, and individuals who engaged in dietary restraint used more problem-focused coping skills.



## **Carrine Spinks**

Faculty Mentor: Dr. Erin Hambrick

Academic Unit/Department: Psychology

Funding: n/a

### **Qualitative Coding of Treatment Alliance through a Pandemic**

With the onset of the worldwide pandemic, COVID-19, the clinical world had to adjust and adapt its means of delivering mental health treatment with a scope never before seen. Utilizing current technology clinicians were able to continue therapeutic services using telehealth. Telehealth, or videoconferencing in lieu of in-person services, is an increasingly common method of delivering healthcare, although its impact on treatment alliance is unclear. (Lopez, 2019) It is toward that aim of clarity, that in an effort to utilize all available data, this study tracks the themes surrounding therapeutic alliance that were given qualitatively by clinicians in response to their patient relationships pre and post the onset of the pandemic, and the change to tele-health. This is part of a larger project that looked at whether therapeutic alliance (relationship between therapist and client) changed as a result of the move to tele-health service provision.

The data was originally collected through a partnership with an outpatient treatment center called FamilyForward in St. Louis Missouri. This organization services youth under the age of 18, who have experienced early adverse childhood experiences (ACEs). To aid in furthering their mission of service, LabPanda has been utilizing self reporting forms and documentation to track the progress of treatment from the perspective of the clinician, client, and caregiver over a period of multiple years. When processing this data and especially after recognizing this unique opportunity to analyze this information through the lens of the onset of COVID-19 in tele-health, it was of the utmost importance to find ways to utilize all of the answers given. That is why in this study, the qualitative data given by the clinicians in the forms of two questions pertaining to treatment alliance, has been taken, and a method of coding the responses has now been developed. This study was done in an effort to track the changes made over this distinctive time period, and to better understand possible relationships. This system incorporated recognition of nine different themes that fully encompassed their data. This was accomplished with an intensive intra-relational coding check system. Although the results may not reveal definitive answers to how different treatment methodologies can serve to better fit the alliance between clinician and patient, the implications are exciting to see and discuss.

# **BIOLOGICAL & HEALTH SCIENCES**

## **Cole Biesemeyer**

Faculty Mentor: Dr. Hillary McGraw

Academic Unit/Department: School of Biological and Chemical Sciences

Funding: n/a

### **Gene expression analysis in the zebrafish lateral line**

Zebrafish (*Danio rerio*), and other aquatic vertebrates, possess a specialized sensory system called the lateral line which allow them to identify changes in water currents and detect nearby prey. The lateral line senses water current through the activity of mechanosensory hair cells. Mammals also possess hair cells, but these can be found in the inner ear and play a role in hearing and balance. Once damaged, mammalian hair cells are unable to repair or regenerate themselves. Damage to mammalian hair cells can lead to irreversible hearing loss, which is a condition that the World Health Organization projects 700 million people will be living with by 2050. In contrast, zebrafish are able to robustly regenerate lateral line hair cells (World Health Organization, 2022). Thus, the zebrafish lateral line provides a valuable system to study the development and regeneration of hair cells. The transcription factor Foxg1 is critical for inner ear development in mammals, though it has not been studied in the zebrafish lateral line. My project uses a zebrafish mutant in the *foxg1a* gene to study hair cell development and regeneration. Using RNA in situ hybridization, I am comparing gene expression patterns in lateral line cells of control and *foxg1a* mutant zebrafish. This study will allow us to determine how *foxg1a* regulates hair cell development and provide potential targets for hair cell regrowth in humans.

**Alyssa Corley, Tinh Nim &  
Christopher Viemann**

Faculty Mentors: Dr. Jeffrey L. Price and Dr. Jin-Yuan Fan,

Academic Unit/Department: Genetics, Developmental and Evolutionary Biology

Funding: NIH R15 Grant

**Analysis of Light-Dependent Regulation of Bdbt in the Eye**

BDBT interacts with the circadian kinase DBT to stimulate its phosphorylation of the circadian transcription factor PER, and it accumulates in eye foci during the dark of a light:dark cycle. Our lab has shown that BDBT foci are constitutively high in the dark and constitutively low in the light. Analysis of circadian photoreceptor *cry* and visual photoreceptor *ninaE* (rhodopsin) mutants showed that disappearance of eye BDBT foci depends upon both the CRY and the RHODOPSIN pathways. The *Arr 1* and *Arr 2* mutants, which affect rhodopsin quenching after light exposure, both eliminated the accumulation of BDBT foci under dark and light conditions. A model has been proposed in which CRY may work through either circadian or visual pathways to influence BDBT levels, and the visual photoreceptor RHODOPSIN may down-regulate BDBT foci during the day by the visual transduction pathway involving phospholipase C or via competitions for Arrestins, which associate with RHODOPSIN-1 during the day and therefore would not be available to interact with BDBT during the day, when no foci are produced. To test the involvement of both visual and circadian pathways in BDBT foci regulation, we have expressed TIMELESS protein (The target of the CRY photoreceptor) in the eyes of flies and knocked down the principal phospholipase C with an RNAi approach in the eye. Knock-down of the phospholipase C produced constitutively high levels of BDBT during the day, consistent with a signaling of RHODOPSIN pathway through this phospholipase C. Likewise, overexpression of TIM produced high levels of expression of BDBT during the day, consistent with a circadian role for CRY, which normally triggers TIM degradation during the day. Finally, a double *ninaE; Arr1* mutant caused high levels of BDBT accumulation, which suggests that Arrestin 1 is not needed for BDBT foci accumulation. However, the foci are most intense around the photoreceptor nuclei, a localization that is not seen in wild type flies. A final aim of our work is to discover what process is producing the daily oscillations of BDBT foci in the eye, as immunoblot analysis of dissected eyes shows no daily oscillation in BDBT levels and normal levels of expression in *Arr* mutants. We are considering the possibility that BDBT becomes part of a large complex during the day, and in this complex the epitope recognized by the antibody is masked. A progress report on our analysis of this possibility will be presented.

## **Christian Dang**

Faculty Mentor: Dr. Leonard Dobens

Academic Unit/Department: Biological and Chemical Sciences

Funding: SEARCH

### **Examining the Tribbles Pseudokinase as a mediator between the opposing transcription factors C/EBP and Cut during *Drosophila* development**

Tissue morphogenesis is a tightly regulated process responsible for organizing the spatial arrangement of cells throughout the development of multicellular organisms. These processes are controlled in part through molecular signals and cues via transcription factors. During *Drosophila* oogenesis, the timed expression of transcription factors guide the cell migration events that contribute to tissue morphogenesis. Notably, the transcription factors Slbo (C/EBP) and Cut have antagonistic roles and have been shown to be expressed at different timepoints during oogenesis. Here, we examined the role of the pseudokinase Tribbles as a mediator between their opposing levels of expression. Tribbles has been shown to promote the turnover of Slbo via ubiquitination and subsequent degradation by the proteasome. We first performed immunostaining procedures of both *Drosophila* ovaries and embryos at various stages to identify the location and levels of expression for each protein. Expression of Slbo and Cut occurred at different stages in specific tissues while Tribbles expression has been shown to overlap with the expression of Slbo and Cut. To further examine the role of Tribbles on the controlled expression of Slbo and Cut, we performed clonal analysis by induced FLP-out clones using the UAS-GAL4 system to misexpress both Cut and Tribbles in separate clones. Clones which were induced to misexpress Cut coincided with coexpression of Tribbles while clones induced to misexpress Tribbles were shown to also coexpress Cut. These results suggest that Tribbles mediates the transition from Slbo to Cut expression by promoting Slbo turnover leading towards expression of Cut and thus contributing to the extent and timing of *Drosophila* Tissue morphogenesis.

**Nhu Do, Nghi Nguyen, Kara Constanzo,  
& Dayanne Cornelio Parra**

Faculty Mentor: Dr. Ryan Mohan

Academic Unit/Department: Biological Sciences

Funding: n/a

## **Correlation Between Neural Localization of Ataxin-7 and K48 Proteins and Circadian Rhythm in Spinocerebellar Ataxia Type 7**

Proteins in our body are programmed to function on a circadian rhythm cycle that controls many important biological functions. This internal body clock is observed in many diseases and where disruption of the circadian rhythm could lead to circadian dysregulation and pose as risk factor for disease development. Thus, understanding the underlying molecular mechanism behind the regulation of this cycle could contribute to the development of treatment and intervention for these diseases. Spinocerebellar ataxia type 7 (SCA7) is a genetic neurodegenerative disease found in humans, involving cerebellar and retinal degeneration. This eventually leads to blindness and loss of motor control. SCA7 is caused by an expansion of CAG trinucleotide repeats in the gene of ataxin-7 protein. Ataxin-7 is a protein that brings a deubiquitinase enzyme called Non-stop to SAGA complex- a chromatin modifying protein complex that plays an important role gene expression regulation. However, mutation in ataxin-7 gene can cause polyglutamine expansion tracts in ataxin-7 to misfold leading to protein aggregation and disruption in the interaction between Non-stop and SAGA complex.

In the Mohan laboratory, we investigate the localization of Ataxin-7 and K48 ubiquitin proteins using *Drosophila Melanogaster* as our model system to understand their normal functions and how alteration in the level of these proteins can lead to dysregulation of other proteins. We use immunofluorescence to detect the proteins in the brains of adult flies while using entrainment to conform the flies to the circadian rhythm to further investigate the impact of circadian rhythm on regulation of protein expression by ubiquitination. The resulting data demonstrates that the level of signals in the brains varies throughout the day and localization suggests that certain parts of the brain express more signals during a specific time of the day. The understanding of normal function of a mutated protein often provides insight into the molecular basis of disease pathogenesis and ultimately, contributes to treatment development for spinocerebellar ataxia diseases.

### **Acknowledgement**

Ryan D. Mohan, PhD; Members of the Mohan Laboratory; University of Missouri – Kansas City, School of Biological Sciences

**Sabrina Doughty**

Faculty Mentor: Dr. Rachael Allen

Academic Unit/Department: School of Biological and Chemical Sciences

Funding Source: n/a

**Morphological Comparison of Turtle Beaks  
in the Context of Lifestyle Traits**

The aim of this research is to investigate beak morphology of turtles in terms of the underlying anatomy and its relationship to various lifestyle traits. All turtles are characterized by the presence of a keratinized beak that overlies the skeletal structure of the upper and lower jaws. Taxonomic diversity of turtles is divided between two primary groups of which Cryptodira is the most speciose. Preserved specimens of turtles were studied and photographed in order to assess qualitative character traits that were mapped on to an existing phylogeny. Examples of character traits studied include overall shape, size, and presence or absence of serrations. After data had been compiled into a spreadsheet it was analyzed using software called Mesquite. Beaks were compared in terms of their keratin and bone components as well as major lifestyle traits such diet and habitat. Among our conclusions, analysis revealed that the shape of the keratin part of the beak correlates more directly to diet than does the shape of the underlying bone. Furthermore, it was shown that overall beak shape broadly correlates with dietary preference. Future extension of this research could incorporate details of ontogeny as well as including members of Pleurodira.

## **Jordy Hernandez**

Faculty Mentor: Dr. Saul Honigberg

Academic Unit/Department: School of Biological and Chemical Sciences

Funding: SEARCH

### **Tackling Cancer with Yeast: Determining the Nonautonomous Effects of Cyclin Alleles**

Cancer is formed by mutations which prevent cells from behaving normally, for example normal regulation of cell division is lost in cancer cells. Cell division is regulated in part by a family of proteins called cyclins, and cyclin levels are raised to abnormally high levels in cancer cells causing unregulated cell division. A eukaryotic model organism, the yeast *Saccharomyces cerevisiae*, has been used to examine how cyclins regulate cell division. There are two types of cell division: mitosis and meiosis in *S. cerevisiae*. Cln1, Cln2, and Cln3 are G<sub>1</sub> cyclins that initiate mitosis. IME1 is a transcription factor that induces meiosis. At any given time, a cell may go through one type of division or the other, but not both. To ensure this, the three G<sub>1</sub> cyclins – Cln1, Cln2, Cln3 – repress IME1 transcription of the *Ime1* gene product; as a result, the cell undergoes mitosis. My research focuses on analyzing cell autonomy of  $\Delta$ cln1,  $\Delta$ cln2, and oe-CLN3 alleles in yeast cells. Many organisms use cell-cell signaling as a method of communication and coordination. Gene products differ in mobility and site of action. Gene mosaics elucidate cell-cell signaling pathways by determining whether a gene product regulates a biological activity through an autonomous mechanism or a non-autonomous mechanism. Autonomous traits affect only cells containing a functional allele of a gene. Nonautonomous traits affect neighboring cells who do not have the functional allele. Studying cell autonomy defines whether cyclins are involved in cell-cell communication. Understanding cyclin function in yeast could help elucidate the role of these cyclins in cancer.



## **Lakshmi Kasi & Mirdhula Ananthamurugan**

Faculty Mentor: Dr. Kashvi Gupta

Academic Unit/Department: Biological and Health Sciences

Funding: n/a

### **Case Study:**

#### **Reversible Cerebral Vasoconstriction Syndrome - A Delay in Diagnosis**

##### *RCSV Overview:*

Reversible Cerebral Vasoconstriction Syndrome (RCVS) is a group of disorders, which are characterized by reversible narrowing of blood vessels in the brain, typically associated with thunderclap headaches.<sup>1,2</sup>

The pathophysiology of RCSV is unknown, however an association with the trigeminal nerve (V1) and dorsal root of C2 is suspected.<sup>1</sup> RCSV can be spontaneous or triggered by pregnancy, physical exertion, acute stressful or emotional situations among other reasons.<sup>1,3</sup>

##### *RCSV Diagnosis and Clinical Course:*

Diagnosis of RCVS is based on the presence of thunderclap headaches, absence of aneurysmal subarachnoid hemorrhage, and typical brain imaging findings other than multifocal segmental cerebral artery vasoconstriction on angiography.<sup>1</sup>

The thunderclap headaches typically resolve within weeks and the vasoconstriction is usually reversed within three months.<sup>1</sup> Potential complications of RCSV include Posetioer Reversible Encephalopathy Syndrome (PRES), ischemic stroke, and intracerebral hemorrhage.<sup>3</sup> 5% to 6% have a relapse.<sup>1</sup>

##### *Case Study:*

FC is a 31 year old female who presented to the emergency department (ED) for headaches. She had a seizure in the ED. The neurology team concluded that her seizure was likely the sequelae of PRES. CT Angiography (CTA) showed a beaded appearance of the Anterior and Middle Cerebral Arteries. 5 days after admission, the neurosurgery team suspected that it was due to RCSV, which is associated with serotonergic medication that FC was taking. FC received a dose of nimodipine. Repeat CTA 3 days later showed improvement in beaded appearance, confirming the diagnosis for RCSV.

##### *Discussion:*

RCSV is very rare. Approximately only three per one million hospitalizations in adults are due to RCVS.<sup>1</sup> However, it should be treated with urgency due to the potential complications. FC had been hospitalized for 5 days before RCSV was suspected and appropriately treated. A potential way to diagnose RCVS faster is to use the RCVS<sub>2</sub> score. An RCVS<sub>2</sub> score greater than or equal to 5 has a 99% specificity and 90% sensitivity for RCSV.<sup>4</sup>

## **Lakshmi Kasi, Julia Cozort, & Taylor Bradish**

Faculty Mentor: Dr. Jared Bruce

Academic Unit/Department: Clinical Neuropsychology Lab

Funding: n/a

### **Sleep, Pain, and Cognition in Individuals with MS and Obesity**

**INTRODUCTION:** Multiple Sclerosis (MS) is a chronic autoimmune disease that affects nearly 1 million people in the United States.<sup>1,2</sup> Sleep disorders are more common in both people with MS (pwMS) and in people with obesity.<sup>1,3</sup> Poor sleep is associated with increased pain and cognitive difficulties in the general population;<sup>4,5</sup> however, the relationship between sleep, pain, and cognition is unknown among pwMS who have comorbid obesity.

**METHODS:** The association between pain, sleep, and cognition was examined in a sample of 27 people with both MS and obesity. Poor sleep was assessed using the Pittsburgh Sleep Quality Index (PSQI) global score and pain was assessed via the MOS Pain Effects Scale. Cognition was assessed using the oral version of the Symbol Digit Modalities Test (SDMT).

**RESULTS:** Poor sleep was significantly correlated with increased pain in pwMS and obesity ( $r_s = .531, p < .05$ ), but not processing speed as measured by the Symbol Digit Modalities Test ( $r_s = -.016, p = n.s.$ ).

**DISCUSSION:** Future studies may wish to examine the clinical value of integrated sleep and pain interventions for pwMS and obesity.

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## **Ethen Kimmel**

Faculty Mentor: Dr. Rachael Allen

Academic Unit/Department: Biology

Funding: SEARCH

### **Geometric Morphometric Analysis of Crocodilian Armor**

Due to the COVID-19 pandemic lockdowns poaching of wildlife has been on the rise. Crocodiles are one of the animals that are being poached at higher rates and this could result in populations of certain crocodilians becoming at risk species. This research investigates to what extent it is possible to identify which crocodilian species a specimen belongs to based on the morphology of osteoderms in the skin. Osteoderms are bony armor plates that are found in the skin of crocodilians that have a defensive function. The goal of this project is to use osteoderms of the nape and dorsal shield regions to differentiate crocodilian skins belonging to various species. This would potentially facilitate identification where cranial evidence is absent.

Specimens of crocodilians preserved in alcohol were observed and photographed. Obtained images were used as the basis for 2D geometric morphometric analysis. Overall outline shape of individual osteoderms as well as regional arrangements were compared using landmark-based methods. The statistical program used is called MorphoJ. This program compares the shape and size of osteoderms and displays morphometric transformations between the photographed specimens. Specimens selected for study represent crocodilians from several geographical regions and include multiple examples from *Crocodylus*, *Tomistoma*, *Alligator* and *Caiman* genera.

For the MorphoJ program the initial focus was on the osteoderms located on the nape of crocodilians two separate analyses were performed. The first analysis was for the group Alligatoridae (alligators and caimans) and *Tomistoma* (false gharial). The second group for study were the Crocodylidae and *Tomistoma*. The reason for the two separate comparisons is due to the major anatomic differences between the groups that prevent direct correlation of the specified landmarks. Additionally the controversial taxonomic status of *Tomistoma* in relation to Crocodylidae and Alligatoridae makes it an interesting case study.

**Michael Kuehn**

Faculty Mentor: Dr. Hillary McGraw

Academic Unit/Department: Biological and Chemical Sciences

Funding: SEARCH

**Genetic Signaling Pathways Promote Hair Cell Regeneration in Zebrafish**

Approximately 18% of adults in the USA report hearing loss: a condition irreversible by current medical science. Understanding the biology of hearing and hearing loss is critical to finding potential clinical treatments. In the ear, specialized cells, called hair cells, sense sound. When hair cells are damaged, they fail to regrow, resulting in hearing loss. Aquatic animals have hair cells that sense water current, and in contrast to hair cells in the ear, they can regrow following damage. Currently, I am performing undergraduate research in the McGraw lab at UMKC investigating the genetic regulation of hair development and regeneration using zebrafish (*Danio rerio*) as a model organism. In my research, I am using a mutant zebrafish line in a gene called *Kremen1* that shows increased development and regeneration of sensory hair cells. I am using this mutant line to understand how and why excess hair cells form in the fish sensory system. Understanding the mechanisms that allow regeneration in zebrafish hair cells could help human treatment research for hearing or balance function loss.

**Funding Acknowledgement:**

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## **Mercedes Madison**

Faculty Mentor: Dr. Cynthia Russell, PhD, RN, FAAN

Academic Unit/Department: School of Nursing and Health Studies

Funding: International Transplant Nurses Society

### **Managing Medications During a Pandemic: A Mixed-Methods Study of Perception of Adult Kidney Transplant Recipients and those Waiting for a Kidney Transplant**

Patients interact with healthcare providers and pharmacists to manage medications. Little is known about the impact of COVID-19 on medication management. The purpose of this study was to describe medication management, Healthcare provider/pharmacist interactions, and adherence, including initiation, implementation, and persistence, during the COVID-19 pandemic in kidney transplant patients and those on the kidney transplant wait list. The International Review Board determined this study was exempt. Using a mixed methods design, 340 adults at a transplant center in the midwestern United States were recruited. The Managing Medications in the Midst of a Pandemic Survey measured healthcare provider/pharmacy encounters and medication management. The Basel assessment of adherence to medications scale measured medication adherence. The sample average age was 58.2 years, 61% male, and 86% White. During the COVID-19 pandemic, 90% had/were currently practicing socially distancing, 87% had /were currently wearing a face mask when out in public, 19% had/were currently diagnosed with COVID-19 and 84% received the vaccine. Medication management: 82% percent plan/organize their own medications. Healthcare team interactions: 98% talked with their healthcare provider since the beginning of social distancing; 13% delayed seeing a healthcare provider because of COVID-19 concerns. Pharmacy interactions: 11% changed their method of obtaining medications from pharmacy due to social distancing but 3.5% delayed refilling medications. Medication adherence-Initiation: 2.5% were prescribed a new medication but did not begin taking it. Implementation-in the last 4 weeks: 19% missed a dose, 6.7% skipped a dose, 16% took a medication more than 2-hour time difference from the prescribed time, and 2.5% altered prescribed amount. Persistence - 3.4% stopped taking a prescribed medication without a doctor's order during the pandemic. A majority of the patients waiting for a kidney transplant and kidney transplant patients acted to prevent COVID-19 but some still contracted the virus. The pandemic changed medication management interactions with healthcare providers and pharmacists. Adherence implementation problems were nearly 20%. The findings will guide future research efforts, including intervention studies, and are relevant to transplant healthcare providers and pharmacists, who must support patients attempting to manage and adhere to prescribed medications during the pandemic.

## **Zaib Malik**

Faculty Mentor: Dr. Timothy Cox

Academic Unit/Department: Oral & Craniofacial Sciences

Funding: Undergraduate Research Associates,

Endowment for Dental and Musculoskeletal Research

### **Investigating the Impact of Maternal Dietary Vitamin A on Susceptibility to Cleft Lip/Palate**

A major concern for most expecting parents is having a child with a birth defect, particularly those affecting appearance and/or are life threatening. Cleft lip with/without cleft palate (CL/P) is one of the most common birth defects in man and can have significant impacts on oral and nasal function. Treatment typically involves 6-10 facial surgeries between birth and the late teenage years to restore full function and improve esthetics. The risk of being born with CL/P is determined by both genetic and non-genetic factors. Yet, despite nearly thirty years of genetic and epidemiological studies, it's still impossible to predict whether a child will be born with CL/P or the severity of presentation, which correlates directly with the number of surgeries.

Vitamin A (VA) and its derivatives (retinoids) play essential roles during embryogenesis and particularly facial development and has been linked to CL/P risk. Vitamin A deficiency (VAD) affects around 190 million people and ~19 million pregnant women worldwide, with recognized consequences for both adult and infant health. Yet, there has been little research on the interaction between normal maternal dietary VA levels and specific CL/P risk alleles.

In mammals, vitamin A is solely obtained from the diet: from animal products as pre-formed VA, and from vegetables and fruits as pro-VA carotenoids. These dietary sources are then converted to retinyl esters in the intestine, packaged in chylomicrons, and transported via serum to various organs of the body. The amount of retinol (the primary circulating retinoid) in the body is tightly regulated, with ~1/4 of the body's retinol needs stored in the liver. The transport of retinol around the body, including its mobilization from liver stores, is principally mediated by Retinol Binding Protein 4 (RBP4). Loss of *Rbp4* in mice results in severe VA deficiency and various diseases. In pregnant dams, VA deficiency from loss of *Rbp4* is associated with various fetal anomalies including ocular, cardiac, skin and facial defects. unless the dams are given sufficient VA in their diet (~5-6x the recommended daily intake) to supply the developing fetal tissues. Thus the *Rbp4* knockout mouse provides a sensitive and tunable model to study the effects of VA on development and disease.

The *Wnt9b* KO line is the best-characterized single gene CL/P model, with between 53% and 85% (depending on the study), of homozygous embryos presenting with CL/P. Importantly, the full spectrum of cleft phenotypes is seen amongst those affected, including complete and incomplete cleft lip, unilateral and bilateral cleft lip with or without secondary palate involvement, and secondary palatal clefts only. Variants in WNT pathway genes are also associated with CL/P in humans. In this study, we used the *Wnt9b* model, bred onto an *Rbp4* deficient genetic background, to test whether cleft incidence and severity are influenced by changes in maternal dietary VA. Dams were switched at 5 days post conception from a sufficient diet (23 IU/g) to either a low VA (4IU/g) or high VA (40IU/g) diet. Embryos were then collected, imaged in 3D, and scored for facial clefting using both qualitative and quantitative methods. Comparison of embryo phenotype incidence and severity on the different maternal diets revealed a window of optimal dietary VA that significantly reduced the incidence of CL/P in this model. These findings raise the hope that optimization of maternal dietary VA during the early stages of pregnancy may reduce the chances of a child being born with CL/P. Further work is needed to determine if the effects of maternal VA are the same for all genetic risk alleles.

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## Truong Nguyen & Nicholas Frede

Faculty Mentor: Dr. Thomas Menees

Academic Unit/Department: Biology

Funding: SEARCH

### Comparison of RT-PCR methods for detecting and measuring RNA lariats

Research has shown *Saccharomyces cerevisiae*, otherwise known as baker's yeast, has properties that warrant its study as a model eukaryotic cell. The *Saccharomyces cerevisiae* Ty1 retrotransposon, a mobile genetic element, is a model for studying HIV replication. Both Ty1 and HIV require the host cell's RNA debranching enzyme, Dbr1, during reverse transcription of the Ty1 and HIV RNA genomes into DNA. In its cellular role, Dbr1 cuts intron lariat RNAs produced during pre-mRNA splicing, promoting their degradation by exonucleases. We measured Ty1 retrotransposition in yeast strains containing different *Dbr1* alleles (wild-type, knockout, and point mutants) using an assay that employs a genetically marked Ty1 element. Results demonstrated the dependence of Ty1 retrotransposition on the activity of the Dbr1 enzyme. We analyzed the activity of the Dbr1 enzyme in yeast strains containing different *Dbr1* alleles using RT-PCR assays that measure the intron RNA lariat produced following transcription and splicing of the *ACT1* gene. We compared two quantitative methods, RT-qPCR and RT-ddPCR. We also measured *ACT1* intron RNA lariat levels from cells grown in the presence and absence of a Dbr1 enzyme inhibitor. The RT-qPCR method was more sensitive than the RT-ddPCR method although modifications could be made to improve RT-ddPCR sensitivity. Overall, we showed that reduced Dbr1 enzyme activity results in decreased Ty1 retrotransposition that correlates with increased *ACT1* intron RNA lariat levels. These results can be applied to screens for identifying Dbr1 inhibitors, which have potential as novel anti-retroviral therapies to treat HIV infection.

## **Shea O'Connor**

Faculty Mentors: Dr. Zach Fischer & Dr. Len Dobens

Academic Unit/Department: Molecular Biology and Biochemistry

Funding: SEARCH

### **AI and the Fly**

I would like to express my gratitude to my advisors and mentors, Zach Fischer, Ph.D., and Len Dobens, Ph.D., for sharing their expertise, support, and direction, as well as their kindness during my grant and training.

The Tribbles (Trib) family of metazoan pseudokinases regulate cell growth, differentiation, division, and metabolism. The study of Trib protein function is impeded by the presence of multiple isoforms in many species, because Trib isoforms exhibit both functional specificity and redundancy. However, *Drosophila* Tribbles—the first Trib gene discovered—is the sole isoform in the fly and regulates the levels of Slbo (homolog to C/EBP, a transcription factor targeted by mammalian Tribs). Investigation of Trib family protein sequences suggests a high degree of sequence conservation, suggesting Trib functional similarities between species is a consequence of structural conservation. One Trib protein crystal structure has been resolved (human Trib1) and suggests a mechanism by which Trib structural changes upon substrate binding potentiate Tribs binding to E3 ubiquitin ligases, resulting in the ubiquitination and targeted degradation of cell cycle proteins and transcription factors. I analyzed the hTrib1 structure and identified a residue—H227—that the authors proposed is required for binding Trib substrates. I proposed that mutagenesis of this residue in *Drosophila* Tribbles and misexpression of this mutant Trib protein (Trbl H227A) might result in novel phenotypes that may teach us more about how Trib family proteins target and direct the turnover of C/EBP family transcription factors. To investigate this hypothesis, I took advantage of a new online tool, Alpha Fold. Alpha Fold harnesses artificial intelligence to predict the structure of proteins not yet resolved by crystallography. The AI-generated structure prediction of *Drosophila* Tribbles suggests the location of this residue is similar in both hTrib1 and the *Drosophila* protein. Next, I generated mutagenic primers and used Q5 mutagenesis to introduce this mutation in the reading frame of *Drosophila* Tribbles within a vector designed for germline recombination. Briefly, injection of the mutant gene into larval germline cells will introduce the mutant into the *Drosophila* genome. Utilizing the binary GAL4-UAS system, we can mis-express this mutant Tribbles gene in fly tissues in a stage- and tissue-specific manner to observe how this mutation modifies Trbl function. Using this mutant fly we may be able to answer outstanding questions in Trib protein research and elucidate the regulation of Trib target turnover in both healthy and diseased states.



## **Elisa Rouse-Salcido**

Faculty Mentor: Dr. Theodore C. White

Academic Unit/Department: Biology

Funding Source: UMKC Funding for Excellence

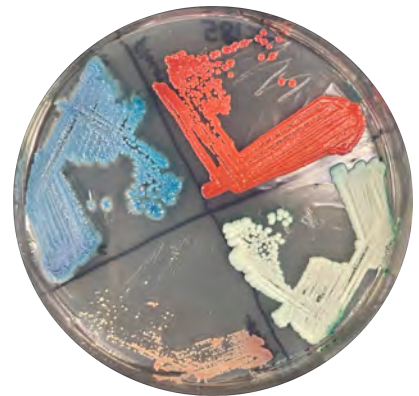
### **Characterizing Oral Mycobiomes in Domestic Dogs**

Our lab focuses on pathogenic fungi, specifically those which show potential for resistance to antifungal drug therapies. It is alarming that the mycological and medical communities know relatively little about the potential for drug resistance in commensal fungi living in the mouths of our dogs, as resistance to commonly prescribed antifungal drugs is a concerning and rapidly growing issue in both human and veterinary medicine. This project will characterize the fungi present in oral swabs from dogs at Kansas State University as well as testing their level of resistance to the commonly prescribed antifungal drug fluconazole. Due to the understudied nature of these fungi, our findings will offer pertinent information to the fields of mycology, veterinary medicine, and human medicine by helping us improve our understanding of the microorganisms within our own bodies as well as those of our pets.

We will be analyzing over 200 buccal swabs taken from dogs at Kansas State University's veterinary center. Fungal organisms are first cultured with special attention to colony morphology and are subsequently isolated. After isolation, optimized DNA extraction and PCR amplification protocols are used to prepare the fungal DNA for genomic sequencing, which allows us to identify each species present in our swabs. This section of our research provides information not only on which species are present, but the frequency with which they appear in the mouths of domestic dogs.

After the isolates have been collected, cultured, and speciated, antifungal drug susceptibility surveys will be conducted on each of them. These surveys will indicate the level of resistance to common antifungal drugs such as fluconazole present in the oral mycobiome of an average domestic dog.

Exploring drug susceptibility in common fungal species will allow medical professionals and researchers alike to assess the appropriateness of certain antifungal treatments, thereby improving our pets' and our own health. Moreover, the results of this project will illuminate routes of exposure to potentially dangerous pathogens, offering insight into the canine oral mycobiome as well as information that allows us to better predict and treat fungal disease in dogs and humans.



## **Logan Sabin**

Faculty Mentor: Dr. Hillary McGraw

Academic Unit/Department: Genetics, Developmental, and Evolutionary Biology

Funding: n/a

### ***Foxg1a* in Zebrafish Hair Cell Regeneration and Development**

Mechanosensory hair cells in the inner ear are responsible for both the perception of auditory stimulus and the sensation of balance. When these cells are damaged or killed, it leads to sensorineural hearing loss and balance deficits. Sensorineural hearing loss is the most common type of hearing loss and can occur in cases of head trauma, ototoxic drugs, aging, and prolonged exposure to loud noise. Hearing loss is the third most common cause of years lost to disability or poor health throughout the world. Aquatic vertebrates have mechanosensory hair cells on the surface of their bodies in structures called neuromasts. The key difference between these neuromasts and mammalian inner ear hair cells is the fact that, in aquatic vertebrates, hair cells robustly regenerate after damage. FoxG1 is a transcription factor that is implicated in neural development, including formation of the inner ear. Deficiencies in Foxg1 causes severe neural defects in both humans and zebrafish. We have found that a mutation in *foxg1a* in zebrafish results in decreased numbers of hair cells in the neuromast and deficiencies in regeneration following damage. These results suggest that Foxg1 is a good candidate for studying the underlying mechanisms of zebrafish hair cell development and regeneration, and a good target for treatment of hearing loss in humans.

## **Taylor Shores & Luke Whistler**

Faculty Mentor: Dr. Ryan Mohan

Academic Unit/Department: Biological Sciences

Funding: n/a

### **The Knockdown of SAGA Complex-Associated Genes Linked to Neurodegenerative Disease Utilizing Multiplexing Gene Targeting**

The SAGA (Spt-Ada-Gn5c-Acetyltransferase) chromatin modifying complex is very large, containing about 20 subunits. This complex functions as a transcriptional coactivator, but we still do not fully understand all its mechanisms. Previous research and evidence have shown that mutation of the SAGA complex leads to neurodegenerative disease like Alzheimer's Disease and Ataxia, as well as cancer metastasis. We do know and have evidence that Ataxin-7 leaves the SAGA complex during different times of the day and functions in other areas of the brain. Dr. Mohan's lab questions what relationship the SAGA complex has with other mechanisms when Ataxin-7 is not bound.

For the project that we have been working on, the goal is to knockdown and repress the genes that cause mutation more effectively. Current methods for knocking-down SAGA subunits are unreliable in culture cells with only about a 40% effective rate. Our novel strategy includes a CRISPRi multiplexing approach where multiple single guide RNA (sgRNAs) act simultaneously and increase the efficiency of CRISPRi knockdown up to 80%.

To accomplish this, we first design sgRNA by selecting guides based on a list of conditions and their estimated efficiencies. Our approach is to clone multiple sgRNAs into a pCFD4 plasmid backbone via homology directed cloning. The pCFD4 backbone is used for this project because it allows for multiple sgRNA to be used at once instead of only one, which we believe will help increase the efficiency of CRISPRi knockdown. After cloning, we assemble a vector and introduce it into bacterial cells which will incorporate it into their plasmid. The plasmid is then recovered and sent to be sequenced to ensure all the components are present and were assembled correctly. Next, the plasmids are tested by transfection using the Lipofectamine 3000 kit in BG3 neuronal cells. The cells are then imaged, and we quantify how many cells were successfully transfected with the CRISPRi knockdown with a western blot if protein concentrations are high enough. .

**Lauren Van Winkle**

Faculty Mentor: Prof. Renee Semarge

Academic Unit/Department: School of Nursing and Health Studies

Funding: n/a

**Analyzing LGBTQ+ Patient Experiences  
and the Potential of Affirmative-Based Practices**

The LGBTQ+ community is one of the largest minority groups within the United States that encompasses every race, ethnicity, age, socioeconomic status, religion, etc. It is widely known within the medical community that LGBTQ+ patients face significant health disparities, such as cardiovascular disease and mental health conditions, attributed to social factors, however there is minimal medical research addressing potential methods to improve this population's health outcomes. Affirmative-based practice has been used by psychologists as an effective way to combat sexual minority stress. Healthcare providers can mirror the affirmative-based methods used in psychotherapy, such as nonverbal and verbal validation and affirmation. The purpose of this research project is to collect quantitative and qualitative data determining the value of affirmative-based healthcare from patients' perspectives. Specifically, it investigates factors influencing LGBTQ+ patients' relationships with their healthcare providers and potential solutions to the issues causing concerning health outcomes. One hundred fifty-eight people responded to an anonymous survey about their healthcare experiences as well as socio-demographic information, allowing statistical relationships to be recognized between sexual orientation, gender identity, and their rapport with healthcare providers. The results confirmed disproportions between straight and non-straight groups, with the non-straight individuals more likely to withhold pertinent health information from their providers due to social concerns, to feel unsafe sharing their gender identity with their providers, and to experience identity-based healthcare discrimination and microaggressions at higher rates. Respondents expressed interest in the use of affirmative-based practices within medicine when they were given the opportunity to share their thoughts on how to ameliorate these situations. The results suggest there is merit in LGBTQ+ representation within medicine, discussion of sexual orientation and gender identity as part of a thorough medical and sexual history, the use of visual symbols of acceptance and non-discrimination in healthcare offices, among other methods to encourage a more inclusive environment which can foster better patient/provider relationships, improving health outcomes.

## **Kyla Vazquez**

Faculty Mentor: Dr. Saul Honigberg

Academic Unit/Department: School of Biological and Chemical Sciences

Funding: n/a

### **Investigating the Regulation of *IME1* and *IME2* by *CIT1* and *CIT2* with Chimeric Colony Assays**

Citrate synthase catalyzes the formation of citrate from acetyl-CoA and oxaloacetate in the citric acid cycle and the glyoxylate cycle, which are two alternative ways in which food sources can be utilized in plants and fungi. In the budding yeast, *Saccharomyces cerevisiae*, *CIT1* encodes the citrate synthase used for the citric acid cycle within the mitochondria and *CIT2* codes for the citrate synthase used in the glyoxylate cycle within the peroxisome. We found that both *CIT1* and *CIT2* affect sporulation in budding yeast. Because sporulation is primarily regulated by the Ime1p transcription factor and the Ime2p protein kinase, we investigated whether *CIT1* and *CIT2* have a role in regulating *IME1* and *IME2*. In particular, we found that *CIT1* increases *IME2* expression and *CIT2* decreases *IME1* expression. Furthermore, chimeric colony assays were performed to determine if *IME1* and *IME2* are regulated through a nonautonomous or autonomous mechanism; in other words, the regulation of *IME1* and *IME2* occurs within neighboring cells or within a single cell, respectively. In these latter experiments, we found that *CIT1* regulates *IME2* using a nonautonomous mechanism and *CIT2* regulates *IME1* using an autonomous mechanism. These assays and further analyses with citric acid cycle and glyoxylate cycle metabolites will provide insight into how *CIT1* and *CIT2* may regulate sporulation in colonies of *S. cerevisiae*.

# COMPUTING & ENGINEERING

## **Daniel Caron**

Faculty Mentor: Dr. ZhiQiang Chen

Academic Unit/Department: Civil Engineering

Funding: SEARCH

### **Augmenting BIM with Real Time 3D and Damage Analytics**

Utilization of emerging technologies for infrastructure inspection and lifecycle planning is an area of increasing interest for engineers and facility managers. Analyzing existing structures through traditional visual inspection methods is resource intensive. New methods to make the process safer, easier, more efficient, and cost effective could be developed using cutting edge data collection techniques and artificial intelligence technology. Building Information Modeling (BIM) is rising to be the new standard in modern construction design, creating an environment for this data to be managed. Data collected using photogrammetry and Light Distance And Ranging (LiDAR) provides 3D representation of an object in the form of a point cloud. A collected point cloud derived from these sources and registered with existing BIM models would give users the capability to review discrepancies between the structure as it was designed and its present state. Further, annotation of structural damage or missing components can be performed and eventually automated using AI techniques. Our research aims to investigate the viability of associating these collected point clouds to an existing BIM model. Eventually, a goal of performing such a process in real time has vast potential for the engineered world.

Exploration of the concept requires photogrammetry data to be collected from an existing physical structure that has a corresponding BIM model. A steel sculpture provided by the American Institute of Steel Construction, and located on the University of Missouri-Kansas City campus, was used in our framework. Sculpture plans were obtained from the American Institute of Steel Construction and used to develop a BIM model. Software was used to generate a point cloud from photos collected with a smartphone camera. The point cloud was then inserted into the BIM model. Once inserted into the BIM model, the point cloud should be geometrically registered to the model. Analysis of the feasibility of such a framework is the focus of the study.

Collection of point cloud data through photogrammetry and LiDAR is not a new process, therefore many software suites offer this capability. However, across the different software suites poor model quality was noted under poor lighting conditions suggesting a strong need for good lighting conditions. A multitude of BIM software packages exist, many offering some ability to insert collected point clouds data. However, geometric association and analytics of data once inserted into the BIM model has not yet been refined.

Augmenting BIM with real time 3D data and damage analytics can provide a decision-making aid while keeping humans in the loop. In this study, we evaluated the process of collecting point cloud data using photogrammetry techniques and importing to a BIM model of the same structure. Feasibility of point cloud collection and integration to an existing BIM model is well within the capabilities of current software suites. Continued development and refinement of the geometric association and analytics of point cloud data within a BIM model will allow for increased safety, efficiency, and cost effectiveness for the Architecture, Engineering, Constructing, and Facility Management industries.

# PHYSICAL & NATURAL SCIENCES



## **Asayiel Alhajeri**

Faculty Mentor: Dr. Mohammad Rafiee

Academic Unit/Department: Chemistry

Funding: SEARCH

### **Measuring the Thickness of Diffusion Layer in Thin Layer Electrochemical Cells with Optical Microscope**

Electrochemical reactions are heterogeneous in nature, and an electrochemical reaction involves mass transfer from the bulk solution to the electrode surface, heterogeneous electron transfer at the electrode surface, and mass transfer back to the bulk solution. The key concepts underpinning electrochemical science are that of the diffusion and diffusing layer, the region in the vicinity of an electrode layer that is affected by electrode reaction. The thickness of the diffusion layer is an important parameter in understanding chronoamperometry, cyclic and hydrodynamic voltammetry. Depending on this diffusion layer's thickness, it can determine the rate of diffusion taking place during the electrochemical reaction. The thickness of this zone can be measured either by simulation or analysis of the electrochemical responses. But interpretation of the concentration profiles and related current time responses require understanding the Fick's law and its related mathematical representations. Although these basics are crucial in understanding electrochemistry, their mathematical representation is challenging, especially for the students or scientists who are new to the field. The thickness of the diffusion layer for a typical electroanalytical experiment varies between 20 to 200 micrometers, depending on the time of experiment. The size is not visible to the human eye easily but doesn't require expensive research-grade microscopes and can be seen using even kids grade microscopes with 100 times magnification. In order to modify and adapt the experiment for testing, we have developed a thin-layer electrochemical cell compatible with low-cost microscopes to demonstrate a microscopy activity in which students measure the thickness of a micrometer-sized diffusion layer. The electrode processes involve the reactions of redox indicators with sharp color changes or acid base indicators with sharp color change in response to electrochemically generated proton or hydroxide, from water electrolysis. These Imaging tools advance electrochemistry education by enabling students to see these electrode processes take place. It gives students a visual medium that makes the entire process relatively easy to follow. This device also aids in the explicit visualization and interpretation of a typical concentration profile near the working electrode surface for chronoamperometry and cyclic hydrodynamic experiments.

#### **Acknowledgments**

I'd like to thank Dr. Mohammad Rafiee for his guidance, Dr. Lida Khalafi and Alexandra Summers from Avila University, and Buwanila Punchihewa.

**Kyle Broley**

Faculty Mentor: Dr. Alison Graettinger

Academic Unit/Department: Earth & Environmental Sciences

Funding: SEARCH

**Xenolith Structures in Welded Basalt Agglutinate  
Associated with Dotsero Crater, Colorado**

The Dotsero maar volcanic crater formed through phreatomagmatic and magmatic processes around  $4,150 \pm 300$  years before present (B.P.) which erupted through sections of Pennsylvanian age sedimentary deposits. The field observations of the eruptive material showed a variety of xenolith structures, or foreign rock fragments within the cooled magmatic material, which can be categorized into four specific groups based on the mineral grain size of the sediments and subtle color variation. The fieldwork focused around three sites, located downslope from the southern crater rim of the Dotsero maar, taking a count of all xenoliths  $\geq 1$ -cm in size in selected agglutinate clasts and gathering samples of the localized surface sediments, where available, and xenolith structures from each site. The surficial sediment samples and two groups of xenolith structures were examined through X-ray powder diffraction laboratory analyses to determine better categorization and to identify if further analyses are needed to analyze potential thermal alterations of the sediment xenolith structures. The results of this style of analysis demonstrate that field classifications of the xenolith structures continue to be the most accurate form of identification and present grounds for further analyses through scanning electron microscopy and thin section observations for differentiation and determination of thermal alterations created through the lava and sediment interactions.

**Joel Busch & Brittany Longwell**

Faculty Mentor: Dr. Majid Bani

Academic Unit/Department: Mathematics & Statistics

Funding: n/a

### **A Mathematical Model to Analyze Vector Transmission and Dynamics of Barley Yellow Dwarf Viral Coinfection**

The Yellow Dwarf Virus affects many economically important crops around the world including barley, wheat, and oats. We construct a mathematical model to investigate the possible dynamics of plants and aphids infected by different strains of Barley Yellow Dwarf Virus. We calculate the basic reproduction number associated with each strain. Using the linear stability analysis we find the stability conditions for the steady states of the model and numerically verify the stability results. The outcomes of the model allow us to make evidence-based recommendations to farmers and the government for optimal control of disease outbreaks.

## **Alejandra Frias Fraire**

Faculty Mentor: n/a

Academic Unit/Department: Earth and Environmental Sciences

Funding: Emerging Research Scholars

### **Armourdale's Correlation Between Industry Pollution and Health Inequity**

Fenceline communities are neighborhoods near major sources of pollution, in which mainly black, indigenous, people of color, and low-income citizens reside. Armourdale is one of the many neighborhoods in the United States that was once redlined and is now facing a serious concern for environmental justice. This neighborhood is located at the center of industrial land use, which has caused many of its residents to have health issues. To approach the correlation between pollution and health inequity, Geographical Information System Maps, along with data models from past reports were used to compare death rates, respiratory diseases, income, race, age, and zoning. The investigation on how different chemicals affected the body at different ages was done to compare the results of different pollutants affecting Armourdale residents. Specific industries were also examined when it came to their pollution as well as the safe distances they should be from residents to execute their work more safely. The research and results provided clear evidence that the industries around Armourdale have been affecting its residents and will continue to do so until drastic measures are taken. Taking into consideration that this concern has been around for a long time, many key points must be considered to create change. They are more community engagement, policies established that can trigger pollution mitigations, education to its community and industries, and economic stability that can help with things such as better health care and better tax budgeting to improve the neighborhood.

## **Trenton McEnaney**

Faculty Mentor: Dr. Tina Niemi

Academic Unit/Department: Earth and Environmental Sciences

Funding: SEARCH

### **Relocating the Ground Rupture of the 1976 Guatemala Earthquake in the Field**

It has been 45 years since the 1976 magnitude MW 7.5 earthquake ruptured the Motagua fault along the North American-Caribbean plate boundary in Guatemala causing one of the most devastating earthquakes in the 20th Century. For a major plate boundary, very little is known about its long-term fault rupture history or the probability of future earthquakes and the hazards it poses to the large and growing population in Guatemala. Furthermore, many sites where the 1976 earthquake rupture were documented could not be relocated with the given published data. However, a large amount of unpublished analog data (paper fieldnotes, 35 mm slides, photographs, etc.) from the U.S. Geological Survey (USGS) have now been georeferenced and added to a database over the summer as my SUROP research project. For this SEARCH research project, I hypothesized that the 1976 Guatemala earthquake rupture can be relocated in the field in Guatemala using this georeferenced database and the geological and anthropogenic processes that have modified the fault scarp documented.

The 1976 Guatemala earthquake occurred on 4 February 1976 at 3:03 A.M. local time and is responsible for an estimated 23,000 fatalities, 74,000 reported injuries, and more than 1 million people left homeless in a country with a population, at the time, of 5.5 million (Plafker, 1976) and a total economic loss estimated at \$1.1 billion USD (Espinosa et al., 1976). A repeat of this earthquake or one from another seismic source would be even more catastrophic given the population of 18 million in Guatemala today.

The goal of this project is to relocate the 1976 Guatemalan earthquake ground rupture in the field utilizing the georeferenced database that I created over the summer as a SUROP research project, to describe the geomorphic settings and the changes that have occurred, and to visit the sites from previous Motagua fault studies (Schwartz et al., 1979). The database houses high-resolution digital versions of personal archive data of USGS geologist, Dr. George Plafker, that include notes, annotated 1:50,000 scale topographic maps, 35 mm slides, photographs, 1:10,000 scale, stereopair aerial photographs and notes from other geologist who investigated the ground rupture shortly after the earthquake. Many of the field locations from the published works on the earthquake (Plafker, 1976; Plafker et al., 1976; Schwartz et al., 1979) cannot be relocated due to name changes of places and towns and because of the lack of GPS coordinates on the original field data.

Relocating the 1976 fault rupture using modern digital mapping technology is needed as assessment of the seismic hazards of this plate boundary fault depend on knowing the exact location of the Motagua fault. This project will have a substantial impact on financial and logistical decisions in context of future field work and studies to characterize the earthquake recurrence of this seismic source. My research to locate the 1975 earthquake ground rupture on the Motagua fault contribute to our understanding of the tectonic-geomorphic expression of active faults, understanding the surficial processes that modify fault scarps, and will aid future studies by identifying potential sites to determine the seismic potential of the fault.

## **Cullen Moriarty**

Faculty Mentor: Dr. Fengpeng Sun

Academic Unit/Department: Earth and Environmental Sciences

Funding: SEARCH

### **Using Climate Models and Crop Modeling Systems to Project Crop Yields in Kansas**

The Decision Support System for Agrotechnology Transfer (DSSAT) software has been used to project commodity crop yields in various environments by allowing users to tune climatic input data such as surface air temperature, precipitation, and humidity to quantify the amount of crop yielded in a specified season. It has been popularly used to evaluate the potential impacts that future anticipated climate change has on crop yields. Users in the scientific community obtained climate data from various general circulation models (GCMs) under multiple greenhouse gas emission scenarios and input climate projections directly into DSSAT. The integration of both tools allowed climate and agricultural scientists to assess the likelihood of crop yields, such as corn, in a given ambient climatic environment. This study seeks to determine the likelihood of corn crop survival in the state of Kansas should anthropogenic activities continue to negatively impact climatic factors associated with crop development. Altogether, this study aims to anticipate any potential threats to our food supply by the end of the 21st century. Adjustments were made to surface air temperatures and precipitation values in DSSAT to quantify the corn crop yields in the predicted circumstances. Outputs from DSSAT show that corn crop yields are expected to be reduced by 10.8% - 30.4% kg/ha for a 1-3 C° increase in average temperature.

This research was funded by the University of Missouri – Kansas City Students Engaged in the Arts and Research (SEARCH) grant.

## Amanda Pierce

Faculty Mentor: Dr. Caroline Davies

Academic Unit/Department: Earth and Environmental Sciences

Funding: SEARCH

### **The Effectiveness of *Sphagnum subsecundum* Moss Removal of Dissolved Carbon Dioxide and pH Balancing of Missouri Freshwater**

This research seeks to better understand the mechanisms of carbon sequestration in Missouri freshwaters through the application of *Sphagnum subsecundum* moss. *Sphagnum* moss is a highly resilient plant, so much so it is a habitat modifier. It can retain up to 26 times its weight in water, as well as stabilizing pH levels. Introducing *Sphagnum* moss to two different Missouri freshwater sources from Indian Creek and Blue River in a tank environment allowed controlled monitoring of changes in dissolved carbon dioxide, alkalinity, and pH levels. The tanks were monitored for one month both indoors and outdoors. pH levels in both tanks and both indoors and outdoors rose to a stable 7.0 in Indian Creek water and 7.5, slightly more basic in Blue River water. Alkalinity increased overall in both water sources to 100 ppm outdoors and 80 ppm indoors, but day to day fluctuations were significantly large. Indian Creek water decreased in dissolved carbon dioxide by 29% and Blue River dissolved carbon dioxide decreased by 30%. Patterns from both water sources and all environments demonstrates strong capacity to absorb carbon, stabilize pH, and increase alkalinity. *Sphagnum subsecundum* moss uses carbon as a nutrient, additional carbon from pollutant sources is also absorbed and filters water, neutralizing acidity in the process. The study demonstrates the ability of *Sphagnum subsecundum* moss to be a significant role in carbon sequestration in addressing climate change.



## Jennifer Vanderslice

Faculty Mentor: Dr. Paul Rulis

Academic Unit/Department: Physics

Funding: SEARCH

### Crafting Continuous Visuals for Electron Band Structures

The unique macroscopic properties of structural and functional materials are due to their atomic and electronic structures. Fundamental understanding of macroscopic material properties begins by studying the electronic structure properties of perfectly crystalline model materials. The band theory of electrons in crystals constrains electrons to a large but finite number of discrete energy states that form bands when plotted as a function of wave vector (Fig. 1). Data in Fig. 1 were computed using the density functional theory (DFT) based orthogonalized linear combination of atomic orbitals (OLCAO) method.

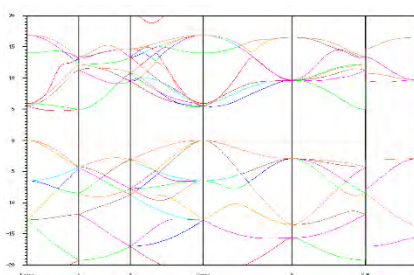


Fig 1. Cubic band structure for diamond – Cubic Path

When stress is applied to a crystal the energy levels will change, but so too will the crystal lattice. The change in lattice parameters may reduce the symmetry of the crystal. Traditional methods of viewing the band structure are tightly coupled to the symmetry of the system. The work performed in this research aims to improve the method of visualizing band structures to allow for smooth and continuous visual transitions between different symmetry lattices regardless of the applied stress or other symmetry

breaking operations.

By adapting a previously proposed triclinic path, it is possible to follow the changes to the crystal continuously. Starting with a simple cubic crystal so that all faces, edges, and vertices are symmetrical, the triclinic path was used to compute the band structure of the crystal and minor changes to the x-axis were applied to simulate stressing the lattice. The triclinic path will remain the same while the crystal is reshaped around it.

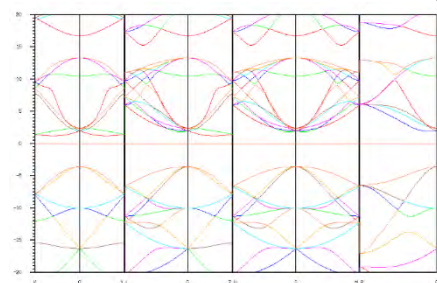


Fig 2. Cubic band structure for diamond – Triclinic Path

The triclinic path is applicable to any variation of the crystal lattice. This means that it can transition from, for example, a simple cubic lattice to a monoclinic one without needing a discontinuous change in the path. While this makes following lattice changes easier there are a few areas that need work. When a triclinic path is applied to a crystal with a highly symmetric lattice (e.g., cubic) then several repeating sequences will appear. The repeating sequences distinguish themselves when the

lattice is modified (Fig. 2). The current triclinic path does not sample all aspects of the crystal than a path specifically built for a cubic system conventionally does. Some effort needs to be applied to develop a type of triclinic path that incorporates more aspects of the purpose-built paths for high symmetry systems without becoming repetitive.

The work with the triclinic path has laid the groundwork for researching a more adaptable universal band structure path. A future path might use some of the same path, but new points along edges or at single vertices to solve the repetition.



# **EUREKA COURSES**

# **Biology H206 Genetics**

## **Morgan James, Kelsey Winemiller, & Natalie McCarthy**

Faculty Mentor: Dr. Saul Honigberg & Dr. Scott Hawley

Academic Unit/Department: Biology

Funding Source: EUREKA Course

### **Gene Silencing of the DabA gene in Pseudo-nitzschia**

With the ever-growing population and growing need for industrial processes generating CO<sub>2</sub> as a waste product, it becomes ever more necessary to harness the power of algae as a potent carbon sink. However, many species of algae generate toxic acids, such as domoic acid, as a byproduct of the conversion of CO<sub>2</sub> into O<sub>2</sub>; which end up in the environment in aquatic wildlife, which eventually makes its way to humans, potentially causing severe poisoning. In our iGEM project, we have proposed a mechanism to silence the gene allowing for the creation of N-geranyl-L-glutamic acid, which is the precursor for the pathway used to generate domoic acid. By inhibiting the DabA gene we can stop the progression of the biochemical pathway used in the diatom to generate domoic acid. We will use a coding region from the DabA gene, which is derived from the diatom Pseudo-nitzschia, inducing an antisense fragment into to induce gene silencing. By inducing an antisense fragment, the diatom will transcribe the short hairpin RNA upon the entry of the plasmid into the cell, eventually leading to the cleavage of target mRNA, stopping the generation of L-NGG, and the pathway to make domoic acid. Therefore, our plasmid containing the sense/antisense fragment will operate to stop the generation of domoic acid, and hopefully aid in stopping the poisoning of our seafood. We expect this new method will allow for the safe harvesting of seafood in areas with algae blooms, and allow for the safety of aquatic wildlife in the oceans. Future research could be done in different algal species producing domoic acid through the Dab pathway, as well as in alternative methods of plasmid insertion into diatoms.

## **Ekjoatroop Kaur, Duha Ahmad, & Sydney Nolte**

Faculty Mentor: Dr. Saul Honigberg & Dr. Scott Hawley

Academic Unit/Department: Biology

Funding: EUREKA Course

### **Cyanocobalamin Synthesis Insert in *Agrobacterium Tumefaciens***

Vitamin B12 is necessary for the human diet and it is naturally animal products. However, variations in diet make this vitamin more difficult to obtain. Spinach, therefore, is an ideal plant because it can be used in many recipes and is widely acceptable to consume for a variety of diets. Through the use of the iGEM system, we will be integrating the genes necessary for B-12 synthesis. This process requires genes such as the *ssuE*, *bluB*, *cobU*, *pgam3*, *idiB*, *cobS* as well as the *ribF* gene. The *ribF* gene (942 bp) is responsible for catalyzing the phosphorylation of riboflavin mononucleotide followed by acylation of FMN to flavin adenine dinucleotide in order to produce flavins, which is the first step in B-12 synthesis. Primers are created, one with an X (prefix), one with an S (suffix) and one with a P site tail (suffix). They all match with the specific locations on our *ribF* gene. PCR is used as our method of amplification. Addition of the promoter. Using the E and S restriction enzymes, we'll cut the promoter from its plasmid. Create opening using E and X restriction enzymes in RBS-*ribF* plasmid. We then mix and ligate both parts together creating the promoter-RBS-*ribF* plasmid. The device will be inserted into spinach so that the plant can start to produce vitamin B12. These newly maintained levels of B12 will help people easily reach their daily vitamin B12 goals. The product will help combat vitamin B12 deficiency and the symptoms it creates for many vegans and vegetarians that cannot obtain this vitamin naturally from their diet.

## **Caden Wehner, Benjamin Vandenburg, & Reese Wood**

Faculty Mentors: Dr. Saul Honigberg & Dr. Scott Hawley

Academic Unit/Department: Biology & Stowers Institute

Funding: n/a

### **Recombinant Ant-CD3 Producing *E. Coli***

The CD3 receptor is a cell surface receptor that recognizes T-cells to elicit an immune response. It is one of many surface receptors that do this, and collectively they are responsible for immune responses to foreign content in our bodies. This can be helpful at times, but it is also responsible for the rejection of organs during transfers. Inhibiting sites such as CD3 can help to stop the body from rejecting organ transfers, which is done using antibodies like anti-CD3. For this project we will be inserting a plasmid into *E. Coli* to make it produce the anti-cd3 antibody. The purpose of this is to make a potentially more cost-effective method of producing the antibody for use as an immunosuppressant in organ transfers. In order to do this, we will cut out each piece of the plasmid with restriction enzymes and combine them into our final product in the form of a plasmid that, when inserted into *e. Coli*, will make it produce the desired antibody.

**Jacqui White, Maddie Vanderbeck,  
Chloe McAdams, & Grace McKown**

Faculty Mentor: Dr. Saul Honigberg & Dr. Scott Hawley

Academic Unit/Department: Biology

Funding: EUREKA Course

### **Pyrethrin Insecticide Gene Insert in Bananas**

Eastern Africa suffers greatly from famine caused by locusts and mosquitos eating crops, such as banana plants. This presents a great need for a natural insecticide. The pyrethrin flower was harvested and filled this need for many years. Unfortunately, this solution was stopped when a monopoly on the pyrethrin flower agriculture caused large crop-loss in Eastern Africa [1].

Our device seeks to harness the natural insecticide capabilities of the pyrethrin flower and inject it directly into banana plants, making it possible for them to protect themselves from harmful pests.

Our device would help prevent famine by protecting the banana crop in East Africa. Furthermore, East Africa has nearly 125 million people who are susceptible to a malaria epidemic. Since mosquitoes are a carrier of malaria, reducing their presence around banana plants will help protect people from contracting the disease [2]. In these ways, our project seeks to prevent famine and malaria in Eastern Africa.

**GECRT-SC 101 Living in a Changing World:  
Nature's Fury**

**Ethan Bennett**

Faculty Mentor: Prof. Joseph Nolan

Academic Unit/Department: Earth & Environmental Sciences

Funding: EUREKA Course

**Poverty and Its Relation to Hurricanes**

Poverty has many negative relations to hurricanes caused by insurance, location, and extreme wealth gaps.

Using statistics representing wealth and their correlation to hurricanes will be used to display how hurricanes affect different places.

Poverty's relation to hurricanes, in the United States, is seen most evidently through statistics regarding flood insurance. In the United States, 51% of non-policy holders that live in high-risk areas are low-income. Compared to the policy owners that live in high-risk areas, 26% are low income. In the eight counties that were most severely damaged by Hurricane Harvey, only 17% of homeowners held flood insurance policies. Areas that have higher risk to hurricanes and flooding attract more low-income residents. In turn, this makes them more susceptible to hurricanes, while also making it more likely that they don't have the proper insurance.

The results show that areas that are more susceptible to hurricanes and other disasters attract more communities with low-income. This combination of poverty and hurricane creates an area that is even more susceptible to hurricanes.

This counteractive occurrence of low-income families living in high-risk areas creates an area where people are more likely to be injured or lose their home in future disasters.



**Emily Bledsoe, Hailey Kerner, Avery Krahnbill,  
Leslie Perez, Jesse Serrano, & Trey Thompson**

Faculty Mentor: Prof. Joseph Nolan

Academic Unit/Department: Earth & Environmental Sciences

Funding: EUREKA Course

## **How do Hurricanes Affect the Mississippi River Delta?**

In this project, our group analyzed the question: ‘how do hurricanes affect deltas’, more specifically the Mississippi River delta. The data we’ve composed have come from secondary sources such as scientific journals and government funded research organizations to achieve the answer to our question. Looking over the data we gathered, we conclude that the shoreline has grown inland over the past forty years. While this could be the result from other causes besides hurricanes, these causes add to the effect of the receding shoreline.

In 2005, Louisiana lost 217 square miles. This is largely due to the two hurricanes, Katrina and Rita, that occurred during that year. Along with hurricanes Katrina and Rita, hurricane Ida, which occurred in 2021, swept away 106 square miles of land along the Louisiana coast. With the data we have accumulated, we as a group do agree that hurricanes can destroy river deltas. The more they occur, the more land we will lose in the process. If this continues to happen, we may eventually run out of land. Granted this is a very slow process, it doesn’t hurt to bring it up now, due to the fact that we may be able to think of ways to lessen the amount of damage hurricanes cause to our land.

**Emma Byrne, Sophia Grantham, & Hugo Mongalvy**

Faculty Mentor: Prof. Joseph Nolan

Academic Unit/Department: Earth & Environmental Sciences

Funding: EUREKA Course

## **How Hurricanes Affect Agriculture in Southern States of the U.S.**

We analyzed secondary research regarding issues stating crop destruction within the southern states, how it affected the economy, and lastly how demand for crops increased and caused a backup in transportation. After analyzing this research, we can conclude that hurricanes cause a massive dent in our production loss of crops as well as significant damage to the land supporting the crops. Furthermore, the high demand and the loss of crops dramatically slow the transportation modes and trade routes. From the data observed because of the effects of the hurricane on the land, there is a higher demand for crop transportation through waterways using large boats such as barges and Panamax vessels. As a result of the hurricane, land transportation, for example, trucks and trains, became more expensive causing an increase in usage of the waterways as previously stated. In addition, we observed estimated total crop losses, paid insurance due to the losses, and lastly unaccounted-for crop losses. Moreover, we discovered the total land in acres of crops destroyed and the specific crops in the southern states. In conclusion, hurricanes have a significant impact on crop distribution and affect overall land function. This topic matters in the future because hurricane relief programs can be prepared for future economic crises regarding agriculture and different transportation routes for the distribution of products.

**Sydnee Flowers, Haylee Harrell, & Cara Braithwaite**

Faculty Mentor: Prof. Joseph Nolan

Academic Unit/Department: Earth & Environmental Sciences

Funding: EUREKA Course

## **The Effect of East Coast Hurricanes on Loggerhead Turtles**

The east coast is the primary nesting ground and home for Loggerhead Sea turtles in the United States. As the probability of hurricanes along the east coast is high, there is a risk that hurricanes are adversely affecting Loggerheads and contributing to the decline in their population. Using previous studies that tagged and counted Loggerheads along the East Coast between 1988-2021, we compared Loggerhead populations and behavior before, during, and after hurricanes to identify if hurricanes posed a significant threat. During hurricanes, the majority of adult Loggerheads follow the current north to preserve energy. After hurricanes, Loggerheads either travel south or begin diving deeper and longer in response to colder temperatures. While around 20-30% of Loggerhead hatchlings are washed away during hurricanes, female Loggerheads overproduce eggs to compensate for the loss. This loss itself is minimized by establishing clutches at different times, locations, depths, and sizes throughout a female's reproductive lifespan. The study revealed that changes in Loggerhead behavior during hurricanes and variability in their reproduction permit adult and hatchling Loggerheads to survive hurricanes with little to no major repercussions. These results indicate that adult Loggerheads are capable of surviving hurricanes, as are the majority of Loggerhead hatchlings. Thus, hurricanes are not likely to pose a significant threat to the presence and population of Loggerheads on the East Coast. Loggerheads have adapted their reproductive activity and behavior to survive hurricanes

**Ethan Kauffman, Rachel Simeon,  
Caitlin Ayala, & Zowie Hayes**

Faculty Mentor: Prof. Joseph Nolan

Academic Unit/Department: Earth & Environmental Sciences

Funding: EUREKA Course

### **Piping Plover Plight?**

The piping plover is a species of shorebird whose population has been in danger since the 1900's when they were overharvested. Their population has remained near threatened due to many factors such as predation and human interference, and our team wanted to see if hurricanes also had a negative effect on their population. Our team found data relating to piping plover populations on multiple islands off the coast of New York including population count, breeding pairs count, and number of active nests. Unexpectedly, we found that the piping plover has experienced an increase in population as a result of hurricanes. Data indicated that in the years following Hurricane Sandy, there was a 23% increase in suitable habitat, chick survival rate increased by up to 32%, and reproduction rate increased by up to 144%. There was also a 23% increase in immigration rate after Hurricane Sandy. There appears to be a correlation between the occurrence of a hurricane and an increase in population, survival, and reproduction in piping plover populations when combining newly created habitat with the increased immigration rate and reproductive rate. The aiding of hurricanes in the healthiness of the piping plover population of New York islands demonstrates that there is no need to plan for or mitigate the effects of hurricanes on their population, which in turn may help remove the piping plover from the near threatened animals list. This trend may be found on a larger scale with other species and as such could be useful in the never-ending search to find solutions for protecting valuable animal populations across the globe. In a future course of action it may be valuable to collect similar data for other disasters and species to try to find similar trends.

**Kara Kirkland, Alex Unseth, & Airrisa Wilson**

Faculty Mentor: Prof. Joseph Nolan

Academic Unit/Department: Earth & Environmental Sciences

Funding Source: EUREKA Course

## **Sunshine State Businesses in the Dark: The Effects of Hurricane Irma on Florida's Economy**

In the late months of 2017, Hurricane Irma devastated the state of Florida and directly affected the economy. Various aspects of the economy were studied and measured, such as those concerning food and natural resources. Analysis showed that Hurricane Irma caused widespread disruption of the natural flow of not only the Floridian economy but the American economy as a whole. Sources such as the Florida Department of Citrus statistically demonstrated the effect of Hurricane Irma on various citrus crops - the department predicted at one point that the price of orange juice would raise almost \$2 due to decreased production and minimal crop harvest. The effects of the hurricane, even before it physically affected Florida, were evident. Due to fear that the hurricane would cause mass destruction, many residents opted to leave, thus driving up gas prices and leaving many stations out of stock - Miami had 40% of its stations empty at one point. Similarly, after the hurricane had left its impact, hotel demand increased in various parts of Florida as displaced residents sought out living spaces. Collectively, these responses exhibit the clear economic changes created by Hurricane Irma. This data is crucial to examine so that destruction caused by future hurricanes can be lessened or even avoided.

## **Lauren Kreisel, Rocio Alvarado, & Aurora Conroy**

Faculty Mentor: Prof. Joseph Nolan

Academic Unit/Department: Earth & Environmental Sciences

Funding: EUREKA Course

### **Essentials People at Risk Need to Keep in their Hurricane Survival Kit**

In the United States it is important to be prepared for natural disasters that occur in the specific region where a person may live. For people in the southeastern and eastern parts of the U.S. the most common natural disasters are hurricanes. Texas is also a state that is at a high risk for these events. Hurricane warnings and occurrences can, and tend to, lead to evacuations. When in an evacuation how would someone know what they should bring with them? This research project helps define the necessities that are most commonly and effectively included in a hurricane survival kit. These items should be loaded in a bag and kept nearby if and when a hurricane happens. Using 15 different sources, which include 3 government funded websites, 4 national websites, 7 state or county websites, as well as a scientific journal. The data was gathered in order to find the answer to the question: What are the most important items for people at high risk of hurricanes to have in a hurricane survival kit?" Equipment that was mentioned more than 50% of the time included non-perishable food, cash, first-aid kit, radio, flashlight, batteries, sleeping bag, blankets, infant supplies, flares, important and personal documents, water, pet supplies, whistle, tools, clothing, matches/lighter, medical equipment and medication, wipes, and a can opener. These items are what the sources deemed as necessary in order to survive a hurricane. Many other items were mentioned but were mentioned between 20-50% of the time or less than 20% of the time. This includes items like duct tape, garbage bags, plastic sheeting, tools and other equipment listed in graphs, where there is a visible frequency of mentions of certain items. Overall, there is a common trend on what different safety websites want to be known as a priority for a hurricane safety kit. Sharing this information and being able to condense what the most important items are to the audience, especially those living in high-risk areas for hurricanes. This in-depth analysis of items mentioned in different websites can help save lives. In order to expand this research, more sources can be analyzed and added, as well as a variety in states included can expand in order to evenly include sources from those states most affected.

**Jacob Lobdell, Charles Bonadonna,  
Drummon Johnson, & Jenny Rodriquez**

Faculty Mentor: Prof. Joseph Nolan

Department: Earth and Environmental Sciences

Funding Source: EUREKA Course

## **Building On Borrowed Time 2: Hurricane-Boogaloo**

Our overall purpose for the poster is to introduce ways in which buildings and residences can possibly be protected from hurricanes in the future. There are many methods that can help protect a structure such as modifying the way it will be built or even the area around it. We will be presenting ways that have been proven to protect man-made structures from Mother Nature's violent hurricanes. With many ways to test a structure's hurricane resistance with different "hurricane simulations". There are many modifications one can make to their own home to prevent a hurricane from tearing their home to shreds such as storm shutters, tree removal, skylights, and French doors can all be used to prevent major damage to a home. Many homes could be destroyed if they do not have methods in place before a hurricane hits. Even more, homes can be protected if they are built properly to withstand the disaster. Many homes and structures can have destruction be prevented if they are built for it, they can also take preventative measures that are easy to add to their homes. This matters because hurricanes can be deadly if not properly prepared for and expensive when destruction is the end result.

*Keywords:* hurricane, building, prevention, safety

**Mattie Martin, Deesha Patel,  
ThuyVy Nguyen, & Addison Bright**

Mentor: Prof. Joseph Nolan

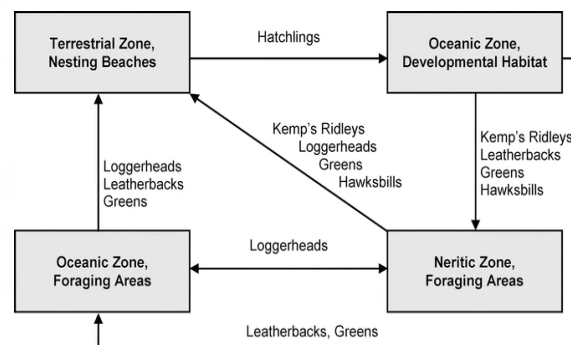
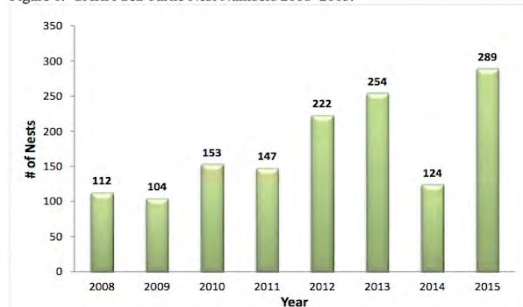
Academic Unit/Department: Earth & Environmental Sciences

Funding Source: EUREKA Course

**Hurricane Effects on Sea Turtles Nesting Habits,  
Habitat, and Whether Speed Effects Their Safety**

Hurricanes influence a lot of sea life, but we wanted to dig deeper on the harm hurricanes can do to turtles on the gulf coast of Mexico. In our project we will make a conclusion about the effects hurricanes have on the nesting of turtles, the habitat of turtles, and lastly whether the speed of a turtle affects their safety. In previous research, they focused on the world, but we found that limiting the location to the Gulf Coast helped us find more broad information. Limiting our location helped us find significant hurricanes effects on turtles and their hatchlings. The method of databases we used were the school databases that we found through EBSCOHost and national geographic that we formed into graphs. Throughout this research we found a large range of the effects that hurricanes have on sea turtles' nests. We formed the information that we found into graphs and figured that in 2009, after Hurricane Ida, Sea Turtle nests were significantly low, coming out to only 104 nests. Hurricanes wiping out a majority of the sea turtles nest results in most if not all baby sea turtles dying. Researching the three basic ecosystems, we learned that the Terrestrial Zone is the most dangerous zone for turtles during hurricanes. Referencing Graphic 2, Terrestrial Zone is where Sea Turtles make their nest to hatch, however they get destroyed during hurricanes. Several loggerhead populations begin nesting before the peak hurricane season, but the incubating eggs are still susceptible to storm impacts. The habitats were destroyed in many different cases, especially with debris going to a lot of different places. The food that turtles eat can get moved in a hurricane. This would make it harder for turtles to find their food to devour for survival. Another thing we researched about the Sea Turtles along the Gulf of Mexico Coast is the speed of the turtle and whether that has an effect of how fast they can swim out of a hurricane. The turbulence from the hurricane can cause turtles to get trapped in riptides and not make it to a safe zone. After researching how fast Black Marlin, Swordfish, Yellow tuna, Killer Whale, Manatees, Crabs, and Oysters swim compared to sea turtles we found that sea turtles have the second slowest swim time (10-20mph).

Figure 1. CAHA Sea Turtle Nest Numbers 2008–2015.





**Daniela Mendez, Alice Rodriguez,  
Erin Thessen, & Holly Vervaecke**

Faculty Mentor: Prof. Joseph Nolan

Academic Unit/Department: Earth & Environmental Sciences

Funding: EUREKA Course

## **Hurricanes: Blowin' Away Unemployment Rates**

With storms as big as hurricanes, businesses are destroyed, and people lose their homes; this study focuses on the effect on unemployment rate. Using unemployment rates from the two years before, the year of, and the preceding two years after the hurricane provided by the Bureau of Labor Statistics, promotes the discovery of the unemployment rate trend throughout the hurricane's destruction and rebuilding period. Looking through the found data from Hurricane Sandy, Maria, Katrina, and Harvey, the data revealed that the unemployment rates were at its highest point two years before and lowered two years after the hurricanes took place, with the exception of Hurricane Katrina whose highest point was the year that the Hurricane actually occurred. The unemployment rate for Hurricane Sandy lowered by 4.1%, Hurricane Maria lowered 2.9%, Hurricane Katrina lowered by 1.8%, and Hurricane Harvey lowered by 0.675%. From the four hurricanes tested, each demonstrated a drop-in unemployment rate after the hurricane averaging 1.895% from the two years before to the second year after. There is a direct correlation between hurricanes and the subsequent drop of the unemployment rate. With each hurricane, including Katrina, the years after continued the downward fall of the unemployment rate. The data results reveal that the unemployment rate progressed downward after the occurrence of the hurricane and possessed an overall decrease from the previous two years. Though hurricanes are natural disasters and cause unimaginable amounts of damage, they provide benefits in some aspects. Hurricanes force communities to rebuild and provide new job opportunities for those in the surrounding community.

**Leah Pappert, Lillian Johnson,  
Audrey Westenbroek, & Kaylee Kytasaari**

Faculty Mentor: Prof. Joseph Nolan

Academic Unit/Department: Earth & Environmental Sciences

Funding: EUREKA Course

## **How Does Climate Change Affect the Intensity of Hurricanes in the United States?**

To prevent extensive damage to personal property and the surrounding community, it is important to know how climate change can affect the intensity of hurricanes in the United States. Although the intensity of each hurricane differs, we have learned and come to the conclusion that climate change can affect the intensity of hurricanes in many ways. We have thoroughly explored graphs, tables and research experiments and have found that several factors of climate change have played a key role in the intensity of hurricanes. One of these factors being stronger winds. From the National Climate Data Center, they found a 25mph increase in the wind speeds. Strong winds can cause extensive damage to buildings, landscaping and communities. Another factor explored was the surface water and atmosphere temperature. Statista found that sea surface temperatures rose by .76 degrees Celsius from 1880 to 2020. This warmer air creates a strong fuel for the storm, which then leads to a more intense storm. Lastly, the moist air and increased temperature of the water causes more rainfall. This was further explored by the Environmental Defense Fund as they found that Hurricane Harvey in 2017 had 15% more precipitation than the average precipitation for hurricanes. They also found that Hurricane Florence in 2018 had 50% more rainfall. Researchers found that this increase was caused by climate change and the increase in surface temperature, as well as the rising of sea levels. More rainfall leads to more flooding and can cause extensive damage to the community and possibly, death to the surrounding population. The increase in climate change across the United States has caused an increase in the intensity of hurricanes.

**Ben Poole, Thomas Mitchem,  
Dallas Welch, & Deanna Hoenshell**

Faculty Mentor: Prof. Joseph Nolan

Academic Unit/Department: Earth & Environmental Sciences

Funding: EUREKA Course

### **Effects of Hurricanes on Birds in the Gulf of Mexico**

This project studies birds in the Gulf of Mexico and the hurricanes that affect them to learn more about how birds react to these disasters. The data on this topic is mostly population studies over time as well as location recordings. A study found that 75% of smaller birds will move inland to avoid the hurricane while 37% of bigger birds will advance through the storm as opposed to detouring or retreating. Another study found that the population of bird species off the coast of Louisiana decreased by an average of 3,915 between 2008 and 2010 due to 2 hurricanes. 10 unique bird species were reported in Arkansas that are normally found in the Gulf of Mexico and are not native to inland states. These studies show that birds are more likely to relocate themselves to somewhere safer during a hurricane. Only strong and big-boned birds can survive the brunt force of a hurricane. The decline of birds from 2008 and 2010 may also be due to the decrease in vegetation after a hurricane. Thus, the destroyed area would not be able to provide a livable environment for birds. Bird species are directly and indirectly affected by hurricanes due to forced relocation, destroyed vegetation, and destroyed food sources. This study determines the future trends of bird species when incoming hurricanes occur.

**Jhalisa Robinson, Rachael Jose,  
Emma Odell, Tamia Bond & Sarah Melvin**

Faculty Mentor: Prof. Joseph Nolan

Academic Unit/Department: Earth & Environmental Sciences

Funding: EUREKA Course

## **How Did Hurricanes Impact the Seafood Industry over the past Twenty Years?**

The purpose is to understand how hurricanes in the past 20 years have impacted the seafood industry and economy as well as the ecosystems they depend on for food and profit. This will be studied using graphs and statistical data on the damage sustained, money utilized in recovery, and the number of people and communities affected. From the data that has been collected, Hurricane Katrina did the most damage to the infrastructure of the United States and the seafood industry. The pollution of Katrina, the reckless dumping of spoiled seafood, and the damage to sewage pipelines destroyed oyster harvesting to the point that the future of oyster harvesting is uncertain. The main concern collected from the research was the hurricane's correlation with the aging sewage pipelines that impact the seafood we harvest. Sea life is not vulnerable to the hazards of hurricanes as humans are, however, humans rely on seafood as a resource. Pollution is a man-made problem. The prices of seafood (in fish and oysters) have increased because of the destruction from hurricanes over the past 20 years, mainly due to the locations near the Delta where hurricanes are the most hazardous. These data and conclusions will be beneficial in studying the effects of hurricanes on the economy specifically in terms of the seafood industry in the United States and how to prevent the economic crises and issues that may arise.

**Sarah Ruhmann, Daisy Ferguson,  
Nadia Saavedra, Nadeya Marchan, & Alondra Mejia**

Faculty Mentor: Prof. Joseph Nolan

Academic Unit/Department: Earth & Environmental Sciences

Funding: EUREKA Course

## **The Effect Hurricanes Have on Coral**

The purpose of our project is to see the short-term effects of hurricanes on the lives and habitats of coral reefs in the Gulf of Mexico and the Caribbean Sea from 2017-2019. The data that our group researched was salinity levels, reefs' soundscapes, and percentage of coral that were living and intact before a hurricane compared to after a hurricane. The hurricanes that our group decided to research are Hurricane Irma (August 30 to September 14, 2017), Hurricane Dorian (August 24 to September 10 2019), and Hurricane Harvey (August 17, 2017). For Hurricane Irma, we found data that showed the percentage of coral that was there prior to the hurricane and after the hurricane, and with that, we found that at Yawzi Point, the mean coral coverage was  $45\% \pm 3\%$  in 1988, but declined to  $6\% \pm 2\%$  in July 2017, and in Puerto Rico, 2,958 of 28,791 corals were broken, overturned, upside down, or loose and 7,457 of 58,970 colonies were damaged. Hurricane Dorian, as we came to find out, had a big impact on coral in places such as Mermaid Reef and the Bahamas where coral was severely damaged or killed due to the effects of the hurricane. At Mermaid Reef, the percentage of corals fragmented increased by 5% or less and there was a decrease in coral coverage that went from 50% to 43% live coral. According to Perry Institute for Marine Science, Hurricane Dorian caused severe damage to 20% of the coral reefs that were examined and it destroyed roughly 30% of the coral reef around the Bahamas. Lastly, we researched Hurricane Harvey and found data that showed about 80% of the corals and organisms in the Gulf of Mexico were dying and that 13 trillion gallons of rain resulted in floods of freshwater, which produced runoff into coral reefs which ultimately leads to the death of coral due to the change in salinity. According to the National Oceanic and Atmospheric Administration, although it only covers less than 0.1% of the ocean floor, coral reefs are a habitat for more than a quarter of all marine fish species and protect shores from flooding and erosion. However, coral reefs are highly sensitive to climate change, severe temperature changes, and inconsistent salinity levels. When hurricanes hit, they typically produce storms that can last for hours or days, resulting in runoff, and can affect coral reefs more than 100 miles offshore. Coral is an important and fragile creature that lives in the oceans, and when hurricanes come around, they are easily broken and destroyed due to multiple factors such as intensity in waters, salinity change, and loose debris in the water. This is an important matter because coral reefs are vital to marine life ecosystems and hurricanes can easily damage them within a short period of time.

## **Alliyah Thanawalla, Amna Bilal, & Justus Peuser**

Faculty Mentor: Prof. Joseph Nolan

Academic Unit/Department: Earth & Environmental Sciences

Funding: EUREKA Course

### **How Hurricanes Affect Agriculture**

Hurricanes can have immense impacts on the livelihoods of farmers and agriculture. Hurricanes can cause infrastructural damage to the soil and the crops that grow out of it. Due to tremors caused by Hurricanes, the soil can become saturated with water causing a landslide that can destroy everything in its path. Flooding can cause erosion, soil displacement, and destroy crops and livestock. Not only can crops be destroyed, but animals can be hurt or killed during natural disasters causing a shortage of livestock and supplies. Hurricanes can also increase susceptibility to diseases which can be more dangerous to human life.

Hurricane Ida not only destroyed crop yields due to direct physical destruction and grain shipments, but the storm caused widespread infrastructure damage and power outages. Food crops exposed to flood waters may face mandatory disposal or diversion per the Food and Drug Administration's (FDA) flood-affected food crop guidance - reducing farm-level production and corresponding income opportunities. In Louisiana, high winds and flooding caused chaos on the cane, rendering it unsellable in the worst-case scenario. Citrus groves were flooded, which is bad enough, but the water is brackish, which means it contains both freshwater and seawater. Citrus trees are quite susceptible to saline, which can reduce their yield and health in the long run.

Florida is one of the states that is most hit with hurricanes. Hurricane Irma damaged more than half the agriculture crops in seven Florida counties. It damaged fruit, whole crops, and farm infrastructure. The hurricane knocked fruit off of trees and destroyed trees by ripping them out from the root. Hurricane Irma reduces Florida's citrus production by 23 percent.

As in the chart above there are many crops that get affected due to hurricanes but the recent studies shows that the Florida Orange Crop is expected to be the lowest due to the hurricane and it's because the bacteria that hurricane leaves afterwards it affects the growth of the oranges. According to Newsweek the Florida harvest would be a lot worse in next 75 years if the hurricane bacteria continues affecting the growth of the crops. The USDA is also providing disaster assistance to the growers so they can replace all the bad trees that were affected due to the hurricane bacteria. In 2021, UF/IFAS received an additional \$2.2 million federal funding to combat the crisis. Like Florida, Louisiana took an extreme hit in their citrus production from hurricane Ida. The LSU Agriculture Center estimated around a \$584 million loss of the citrus industry due to hurricane Ida.

## Taylor Urbanek

Faculty Mentor: Prof. Joseph Nolan

Academic Unit/Department: Earth & Environmental Sciences

Funding: EUREKA Course

### The Effect of Hurricanes on Coral Reef Colonies in the Caribbean

The purpose of this project was to determine the immediate and lasting impact of hurricanes on coral reef colonies in the Caribbean, with study sites spanning from Belize and the Gulf of Honduras to the U.S. Virgin Islands and Puerto Rico, usually located 5-10 miles offshore. The intermediate disturbance hypothesis is one that was explored by hundreds of researchers throughout the process of studying these effects. The biggest impact on coral reproduction and recruitment due to hurricane activity was observed in the first year following the hurricane incident (about 17% decline). It was found that hurricane winds and waves can be beneficial to the spreading of asexually reproducing corals such as *Montastraea annularis*. The aid and detriment caused by these storms has confused many researchers. The combination of natural disasters and weather such as hurricanes with non-weather factors such as mass coral bleaching create a perfect environment for the destruction of weaker species and the rise of species that have adapted to these conditions. There is also the concern of overpopulation versus endangerment and extinction of certain species. Overall, these studies have opened this area to innovative ideas of research to find ways to protect and sustain these reefs. As anthropogenic actions cause major global warming consequences, hurricane frequency and severity are increasing; it is important to know extent of and mitigate the impact that these aggressive storms have on coral colonies to better learn how to protect and conserve them in the future.



# **GECRT-SS 111 Health Issues in Aging**



## **Isabel Aguado**

Faculty Mentor: Prof. Jessica Bergner

Academic Unit/Department: School of Nursing & Health Studies

Funding: EUREKA Course

### **Financial Wellbeing of Older Adults**

- Introduction
  - A lot of people when they think of older adults 50 years old and older think they are all retired and financially well off. However, that may not be correct. Therefore, the purpose of this study is to examine the generational differences in the ability to afford healthcare as they age.
- Results
  - Study findings show that more than half the participants can afford the cost of healthcare out of pocket or through healthcare. Whereas, about a quarter of the participants could not afford healthcare when they were younger.
- Methodology
  - 25 participants were chosen to be interviewed, with 5 in different age groups. They were asked specific questions that followed the theme of finances using a semi-structured interview guide.
- Conclusion
  - After carefully assessing the data there was a noticeable trend that out of the 25 participants a few struggled to afford the cost of healthcare when they were younger. Also, while over half the participants are stress free now, most of them were in their 50s and not retired. This concludes that a lot of older adults are still working towards retirement. In future research studies I think interviewing participants from specific communities would differentiate the results.

## **Rayan Al-Hamdi**

Faculty Mentor: Professor Jessica Bergner

Academic Unit/Department: School of Nursing & Health Studies

Funding: Eureka Course

### **An Investigation of Three Effects on Aging and Retirement**

*Introduction:* Aging and retirement will forever be a triumph only few may achieve. As you age, your body deteriorates over time, the experiences and knowledge you gain help you to push forward and build resilience. However, it takes effort, skills, and knowledge to reach this peak. This study sought to understand the mental, physical, and financial effects of aging and retirement.

*Methods:* Twenty-five individuals aged 51 to 95 were interviewed via a semi-structured 10-item interview. Questions inquired about three effects on aging and retirement: mental, physical, and financial. After interviews were completed, responses were analyzed using thematic analysis guided by grounded theory.

*Results:* Responses were mostly positive, with some being negative or neutral. When looking at all three effects previously mentioned, most of our interviewees found themselves accepting of their circumstances and feeling accomplished with how much work they put in, but still had hope that changes would be made to make the transition to adulthood, and the later years of adulthood, less taxing.

*Conclusion:* This study provided insight into the later years of adulthood. It is important to understand the implication for financial security in order to better care for older adults. This information could also aid in better planning for younger adults.

## **Ayra Ali**

Faculty Mentor: Prof. Jessica Bergner

Academic Unit/Department: School of Nursing & Health Studies

Funding: EUREKA Course

### **Analyzing Sources of Healthcare Financing for Older Women**

*Introduction:* Healthcare prices have increased significantly, impacting seniors across the United States. To pay for these significant expenses, seniors must rely on a variety of payment methods such as Medicare, personal savings, insurance, and out-of-pocket costs. According to the US Census Bureau's Survey of Income and Program Participation, in the 55 to 66 age group about 50 % of women had no retirement savings in 2018 (King, 2022); The purpose of this study is to determine sources of financing for women, specifically related to healthcare expenditures and retirement savings.

*Methods:* Data was collected by a semi-structured interview guide, with 15 male and 12 female participants of ages ranging from 50-90 being asked 10 open-ended questions. Questions asked about healthcare costs, inflation, financial stress, past sources of income, healthcare payment sources, and most expensive healthcare costs. Data was analyzed using thematic analysis utilizing an inductive grounded theory approach.

*Results:* Most women surveyed were financially secure regarding healthcare costs, but a significant amount had insufficient insurance funds and paid out-of-pocket for some portion of their healthcare. Other sources of paying for healthcare included pension, retirement savings, insurance, and relying on a spouse. Women were also relatively secure in terms of retirement funds, with many participants having started investing in their 20s.

*Conclusion:* While most women surveyed could pay for healthcare, they relied on different sources to do so. Retirement savings were sufficient and not dependent on additional income sources. This suggests that older women are not adequately covered by healthcare insurance plans.

**Jeanna Allen**

Faculty Mentor: Prof. Jessica Bergner

Academic Unit/Department: School of Nursing & Health Studies

Funding Source: EUREKA Course

**Fighting Difficult Times**

Growing older is not something that we look forward to doing, but sometimes life gets the best of you, and it catches up way faster than expected. Before you know it, you're struggling to do simple tasks that you never really thought of before and those 59-cent bag of chips have finally caught up with you. Instead of saving for this time when you had the extra you decided that saving for retirement was not as important because planning as a young adult was not something you were too good at. Now your 65 living off Social Security and you cannot afford to live life comfortably. Since you are living off Social Security you have a fixed income and not a lot of money left over. So now you are stuck shopping in the foods that are easy to fix, and some are not so healthy for your aging body. Therefore, the purpose of this study is to examine how financial situations as a child or young adult affect the likelihood of poverty and financial insecurity after retirement. 25 individuals were interviewed. The data that was found was that many did live month to month. Some of those individuals who did live month to month also struggled living in lower class as a child. Deciding that maybe if their childhood did not consist of a struggle, they would have grown up without living that same struggle. Data showed that the individuals that were not poor as a child did not struggle as a child or live-in poverty, and they lived middle to upper class lives. They had social security but still had other saving or income. It was all consistent to our findings.

## **Thomas Bellman**

Faculty Mentor: Prof. Jessica Bergner

Academic Unit/Department: School of Nursing & Health Studies

Funding: EUREKA Course

### **How Financial Insecurity as a Child Impacts Older Adult's Later In Life**

#### **Introduction**

Studies have shown children growing up in poverty have an increased chance to continue in poverty later in life (Boghani, 2017). There are clear racial and ethnic discrepancies when assessing poverty, with minority members being impacted at greater rates (Boghani, 2017). As adults age their financial status as a child may impact them. The purpose of this study is to identify similar factors between adults that grew up with financial insecurity to adults that are now having financial insecurity issues, or still having issues from childhood.

#### **Method**

Interviews were held with 25 people ranging from 50- 95 years old. The questions that were asked dealt with inquiring about their childhood and current life about financial insecurity questions. The format of the surveys was a semi-structured interview guide. The data was analyzed using thematic analysis guided by grounded theory.

#### **Results**

Findings suggest that older adults do not perceive their financial situation as a child impacted them as adults. One thing that was found from the interviews that the over 80 group went to less annual wellness checks on average than their younger counterparts.

#### **Conclusion**

Though it can be difficult, people do have the power to change their own financial situation. Future studies should go more in-depth and tailor more specific and less vague questions. This would allow future studies to gather more insightful evidence.

## **Abbie Cafazza**

Faculty Mentor: Prof. Jessica Bergner

Academic Unit/Department: School of Nursing & Health Studies

Funding: EUREKA Course

### **Geriatric Health Factors and the Improvements in Geriatric Medicine**

#### Introduction

Physical activity has been proven to increase overall health in individuals as they age. However, there are other important factors that play into the health status of our society's older generations. The purpose of this study is to determine what factors play a role in geriatric health status, and what improvements in the medical field have been the most impactful to geriatric health.

#### Methods

Data was collected through the use of a semi-structured interview guide of 23 individuals from ages 50-90. These individuals were asked questions pertaining to their health status, medical experiences, and opinions. Data was analyzed using a thematic analysis guided by grounded theory.

#### Results

Through these responses, it was clear that there were four major factors that these participants felt played a role in their current health status; age, diet, activity level, and previous medical issues. The data also showed that these individuals deemed the most impactful medical advancements to be transplant surgeries, vaccines, pre-screening/testing, and the overall improvement of technology.

#### Conclusion

This research could potentially help medical researchers and developers to understand what services matter the most to patients. Many of the individuals in this study showed an understanding of the importance of staying active and eating healthily in order to improve their overall health status. The geriatric community wants to learn how to stay healthy, and continuing studies to determine what aging individuals need can help healthcare providers to effectively improve geriatric medical care.

## **Cameron Cobb**

Faculty Mentor: Prof. Jessica Bergner

Academic Unit/Department: School of Nursing & Health Studies

Funding: EUREKA Course

### **Older Generations Opinions and Perspectives on the Health Care System**

*Introduction:* America's population is getting older, which means an increase in the demand for health care and related resources. Resources are limited, and the needs of older adults may not be well understood. This study sought to understand older adults' perceptions of the healthcare system, specifically what they look for in a healthcare practitioner and their relationship ideals.

*Methods:* A semi-structured 9-item interview was conducted with 25 people, each falling into one of the age groups: 50-59, 60-69, 70-79, 80-89, and 90+. The surveys were conducted in person or on the phone. Data was evaluated using a thematic analysis guided by grounded theory.

*Results:* Findings suggest that older generations prioritize the quality of their healthcare over cost. This includes preferring private practice because they receive more individualized care. Also, a major theme was building a relationship and trust with their physicians. They feel comfortable discussing personal information when this relationship is formed. They also express opinions and concerns when needed and feel comfortable utilizing resources to receive help when needed.

*Conclusions:* The results of this research defy the stereotypes people have towards older populations. They are sometimes seen as frugal individuals that might not have a full understanding of what is going on or are capable of being advocates for themselves; but this is entirely false. As the general population continues to age, the health care systems should accommodate for what the people in demand for care prioritize and need.

## **Lydia Cripe**

Faculty mentor: Prof. Jessica Bergner

Academic Unit/Department: School of Nursing & Health Studies

Funding: EUREKA Course

### **Differing Understanding of Sexuality Across Generations**

*Introduction:* Differences in opinion regarding one's sexual orientation seem to differ across generations. Unfortunately, these differences in opinion can result in negative impacts, especially when health care is concerned. Different opinions in any area are typically prompted by level of understanding, and sexual orientation is an excellent example of just that. As the commonness of seeing minority sexual orientations continues to increase, it is important to understand older adults' perceptions of sexual orientation. The research was conducted to better understand older generation's thoughts regarding sexual orientation in healthcare.

*Methods:* Interviews were conducted with 25 individuals total, 5 in each their 50s, 60s, 70s, 80s, and 90s. Basic demographics were recorded, and then interviewees were asked to anonymously share opinions on various situations regarding sexual orientation and health care experiences. Data was analyzed using thematic analysis by grounded theory.

*Results:* Most people felt they had a decent understanding of sexual orientations, but they were not overly aware of what disparities this community faces; however, a substantial amount of feedback from interviewees stated that a way to make this issue more well-known could be to expand education regarding this subject.

*Conclusions:* The older the individual, the less knowledgeable they were on the subject regarding health care. Moreover, it appeared that the large majority of survey participants cared about this problem, so to confront this issue, educational expansion and reform will be important.



## **Adrianna Cusimano**

Faculty Mentor: Prof. Jessica Bergner

Academic Unit/Department: School of Nursing & Health Studies

Funding: EUREKA Course

### **How Do Gender Roles Affect You? Or Do They?**

*Introduction:* Gender roles are expectations by one's opinion on what they believe the gender of a certain worker should be or if this certain activity is for girls or if it is for boys. When having these certain expectations, it is setting oneself up for disappointment. Like, if one expects a male doctor and it is a women doctor some may be disappointed, there could also be different expectations depending on age and generation. The purpose of this study was to assess, and to see if these generations have differential gender role expectations.

*Methods:* 25 participants both male and female ages in there, 50's through 80's were asked 10 questions regarding gender roles. To analyze data a thematic analysis guided by an inductive theory approach was used

*Results:* When looking at results it was found that there is no major difference in answers between genders, but there are slightly different answers with age, but not anything drastic. Mostly everyone did have gender role expectations in some way whether that be in a healthcare setting or gender roles at home.

*Conclusion:* This study suggests that gender role expectations are relevant and to this day most people still expect certain genders healthcare. Even from generation and generation the data proves that expectations are still held to a certain standard, doesn't matter age or gender.

## **Audrey Danielson**

Faculty Mentor: Prof. Jessica Bergner

Academic Unit/Department: School of Nursing & Health Studies

Funding: EUREKA Course

### **Management of Mental Health Variation Among Older Adults and Contributing Factors**

**Introduction:** Positive mental health is necessary to the prosperity of Americans. Stigma is one of the biggest stressors in older adult mental health. Community health must be able to acknowledge the risk factors in order to properly examine the issue. As these adults age, it becomes harder for them to communicate issues - like through social changes to where they are unable to effectively describe what is going on or any other factors that may contribute. Therefore, the purpose of this study is to show how management and factors of mental health vary in older adults.

**Methods:** 20 interviews were completed including adults aged 50 to 88. Questions assessed anxiety/depression, life stressors, management, and well-being. Data was analyzed using thematic analysis through an inductive grounded theory.

**Results:** Even though each member of the group separately addressed their assigned questions, we synthesized to properly analyze our findings by then responding to each other. Results show that most older adults feel their mental health has been impacted by previous life experiences (50% of data), but can be fairly managed with things like activities, or communicating with trusted loved ones. As these adults get older, they seem to worry more about communicating as they feel to be a bother to others when they do so. 30% of the data felt that mental health was associated with stigma, which prevents mental health discussion and management for all Americans.

**Conclusion:** In this study, it is clear that mental health is an apparent issue, especially in older adults. Because of this, we must take the next step in normalizing mental health struggles in releasing the stigma that is associated with it. By doing so, we open the table for a much more free environment where Americans can feel comfortable expressing their concern and get help. This opens it up for the adults as they are not limited to self-management, being coping activities like: journaling, exercise, prayer, cooking, etc.

## **Grace Filer**

Faculty Mentor: Prof. Jessica Bergner

Academic Unit/Department: School of Nursing & Health Studies

Funding Source: EUREKA Class

### **Aging Adults in a Digital Age**

*Introduction:* With an ever-increasing amount of technology and social media, it is important to study its effects on society. The effects on younger generations are often studied, excluding older generations from the narrative. Many view the effects of social media and technology in a negative light, but it is possible that it can have a positive effect on elders, especially when it comes to socialization. The purpose of this study is to examine the differing attitudes about social media, technology, and their effects among older generations.

*Methods:* Twenty-five interviews were conducted with older adults ranging from 50 to 96 years old. Questions gauged perceptions on the benefits and drawbacks of social media and technology, its effects on mental and physical health, and its impact on healthcare.

*Results:* Results indicated a predominantly positive view of the effects of social media and technology. The ease of communication and the increased availability of information were among the themes commonly discussed.

*Conclusions:* Overall, older generations possess a positive outlook on social media, technology, and their effects. They appreciate the level of communication and information exposure that social media and technology have introduced. These results are different from the misconception that many people hold: that older adults view the introduction of social media and technology as having endless negative effects. Future studies could assess how healthcare agencies cater to older adults specifically using technology and social media.

## **Rishabh Gaur**

Faculty Mentor: Prof. Jessica Bergner

Academic Unit/Department: School of Nursing & Health Studies

Funding: EUREKA Course

### **Old is Gold ... or is it?**

#### **Introduction**

Healthcare costs and new technologies in healthcare have significantly changed, leaving older people to adjust. Inflation and rising healthcare costs due to novel technologies can make it more difficult for the older population to afford healthcare. Therefore, the purpose of this study is to examine economic changes and their effect on older people who have experienced these changes within their lifetime.

#### **Methods**

25 individuals (five individuals in their 50's, five in their 60's, five in their 70's, five in their 80's, and five in their 90's) were interviewed with a ten-question semi-structured interview guide about the affordability of healthcare and challenges that these individuals have had due to healthcare costs. Data was analyzed using a thematic analysis guided by an inductive grounded theory approach.

#### **Results**

Almost all respondents mentioned the increase of costs due to inflation and technology. Also mentioned, however, was the increased ease of access to healthcare due to new technologies and insurance's role in making it easier to afford care.

#### **Conclusion**

Although healthcare costs have significantly increased, insurance mitigates their impact. The stereotype that all older people struggle with healthcare bills was not true among our respondents. A future research study could target only those older individuals who do not have health insurance to further identify the challenges in healthcare costs.

## **Annabelle Gettys**

Faculty Mentor: Prof. Jessica Bergner

Academic Unit/Department: School of Nursing & Health Studies

Funding: EUREKA Course

### **The Generational Divide and Political Beliefs**

Political disagreements often interfere with healthcare reform. The inability to getting everyone on board leads to things like extreme price gouging on medications, not being able to afford insurance and ending up paying more for that and decrease in mental health awareness. The purpose of this study was to understand older adults' political views and their stance on our current healthcare system.

30 individuals aged 47-84 were interviewed using a semi-structured interview. Demographics and perceptions on the way our healthcare system is functioning currently were gathered. Data were analyzed using thematic analysis guided by grounded theory.

The results showed that most people regardless of age and political beliefs did not completely agree with how our healthcare system is functioning. Everyone had very similar lifestyle choices in terms of taking care of their physical well-being. Most of the participants included going on walks around their neighborhoods, and a few of them stated that they are taking medications to take care of themselves.

It can be concluded that political beliefs do not play a huge role in certain aspects of healthcare. The participants agreed that healthcare is too expensive, making it not accessible to most people. When it comes to things like vaccinations, there is still a divide and has become more of a pressing issue due to the Coronavirus vaccines.

## **Leah Green**

Faculty Mentor: Prof. Jessica Bergner

Academic Unit/Department: School of Nursing & Health Studies

Funding: EUREKA Course

### **Older Adults Perception on Their Current Financial Living Situation, and How Their Childhood Effected Their Adulthood**

*Introduction:* The purpose for this survey was to gather information about how older adult's financial situation is impacted by their childhood. This survey is important because to know how different people's childhood affected them going into adulthood and to possibly predict how the younger generations could be affected in their adulthood due to some of the factors that were shown in this survey. In addition, there are many different perceptions about the elderly demographic in healthcare and it is important to know that everyone does not receive the same level of professional healthcare. This could be due to different attitudes, experience, accessibility, and many other factors when it comes to healthcare.

*Methods:* In my group, 25 individuals were interviewed using 10 questions that asked about financial stability as a child and as an adult, food scarcity, and similar topics. Participants were aged 50 to 90. Data was analyzed using thematic analysis guided by grounded theory.

*Results:* Findings suggest that childhood finances were not predictive of adult finances. However, the qualitative analysis showed that having health insurance typically determined if you were able to get quality and frequent medical care as a child/ young adult.

*Conclusion:* It appears that how you grew up doesn't necessarily determine how the rest of your life will go. The sample reported diverse financial experiences which suggests that different factors play a role in one's financial stability. Future studies should assess how these impact older adults.

## **Natasha Hillard**

Faculty Mentor: Prof. Jessica Bergner

Academic Unit/Department: School of Nursing & Health Studies

Funding: EUREKA Course

### **Progression of Mental Health in Older Adults**

*Introduction:* Mental Health is an issue that afflicts millions of people daily. As we age, a number of factors contribute to how mental health progresses and how we deal with these issues. This study specifically focuses on mental health in older adults by exploring generational differences that cause an increase in mental health problems and impact how older adults cope with mental health and seek treatment.

*Methods:* 20 participants aged 50 to 88 were interviewed. Interviews were conducted using a semi structured guide provided clear analysis of how the participants were affected by mental health, nature vs nurture, and the level of comfortability seeking help or treatment. Data from the study was analyzed using a thematic analysis guided by a inductive grounded theory approach.

*Results:* Findings propose that the majority of older adults struggling with mental health concerns were impacted in childhood and faced generational stigmas on dealing with mental health. Findings also suggested that most older adults became more comfortable in older age, learning to cope with mental health and seeking treatment.

*Conclusion:* This study provides insight into mental health difficulties in older adults and the stigmas surrounding them. The data suggests ways in which we can identify, treat, and improve mental health problems in order to increase overall quality of life. Additionally, older adults are resilient in coping with mental health challenges.

## **Arinze Ihenacho**

Faculty Mentor: Prof. Jessica Bergner

Academic Unit/Department: School of Nursing & Health Studies

Funding: EUREKA Course

### **Impact of Age and Attitude On Gender Roles**

**Introduction:** The impact of age on women is more than on men. Life situations such as healthcare, professionalism and societal views mostly affect women of old age (Bragg, Renold, Ringrose et al., 2018). There is a great difference in how these stereotypes affect young women compared to older women. Roles are defined as how women and men should generally act, attitudes of how they should act and normative elements in their lives. This study aims to assess attitude change based on age and identify how gender disparities affect healthcare professionalism and interventions (Heise, Greene, Oppen et al., 2019).

**Methods:** Five participants of different ages, between 56 to 94 years, are interviewed on their attitudes toward gender roles. Data was analyzed using thematic analysis guided by grounded theory.

**Results:** From the interviews, it is evident that the gender roles perception is changing with time due to civilization. There are minimal differences in how both genders engage in professional roles, and women are engaging in professional roles just like their men counterparts.

**Conclusion:** The findings of this study suggest that women have to be empowered as they perform well in healthcare professionalism, just like men. Civilization has contributed to changes in gender roles perception. This differs from traditional stereotypes where women were viewed as homemakers and were expected to be caring. Women were viewed as weak but caring. On the other hand, men are considered firm and active by resisting weakness. In the future, studies should focus on the potential of women in the provision of healthcare services.

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## **Sierra Johnson**

Faculty Mentor: Prof. Jessica Bergner

Academic Unit/Department: School of Nursing & Health Studies

Funding: EUREKA Course

### **What Do They Say? Generational Perspectives on Sexual Orientation**

*Introduction:* Sexual orientation is a topic that has recently gained power in society. Sexual orientation likely impacts the older generation via discrimination, health disparities, and lack of acceptance. Research on sexual orientation and minorities of older adults is scarce which is damaging to the understanding of it. Fear of a negative response in healthcare situation may lead older adults to not disclose their sexual orientation. Therefore, the purpose of this study is to examine the generational differences in the understanding of sexual orientation and its implications in healthcare settings.

*Methods:* 25 semi-structured interviews were conducted with 10 questions to individuals 50 years old and older. Interviews conducted described themes such as acceptance, discrimination, awareness, and healthcare. A thematic analysis was used guided by an inductive grounded theory approach.

*Results:* Findings suggest, generationally the understanding of sexual orientation in general and in healthcare settings changes. There was lack of awareness of discrimination, but a strong contempt for any discrimination that does occur. For example, most responded with unawareness of any known differences in healthcare due to sexual orientation but concluded that any discrimination in healthcare is wrong.

*Conclusions:* This study provides insight, and the perspectives of older generations view on the growing understanding and acceptance of sexual orientation. Contrary to many stereotypes and beliefs the older generation is well versed in the changing world and the intolerable discrimination of people in healthcare.

**Saad Khan**

Faculty Mentor: Prof. Jessica Bergner

Academic Unit/Department: School of Nursing & Health Studies

Funding Source: EUREKA Course

**The Priorities of Older Americans in Healthcare**

Healthcare costs and norms have drastically changed over the past 75 years. Older adults in America have found themselves constantly adapting to the new changes. It is possible that older adults have changed the way they utilize physician visits. This study aims to discover how the priorities of aging generations differ when it comes to visiting a physician.

To discover how the older generations felt about the current healthcare system, 25 interviews were conducted with participants aged in their 50s, 60s, 70s, 80s, and 90s. Participants were recruited via quota-sampling. The interviews were conducted virtually and in-person. Questions about their physicians' values and their overall priorities when meeting with a physician were asked.

Results suggest that a large amount of the respondents prioritize trust and comfort when visiting their physicians. Older adults of all decades appear to desire quality care to ensure that any of their issues are met with the proper treatment. While a small portion of respondents disagreed, cost was not the main priority when considering a new physician.

Overall, the study displayed the priorities and the mindset of the older generations in healthcare. While many people often stereotype that older people are less adaptable to technology than younger generations, the results show that with trust and comfort, they will gravitate towards new technologies and treatments.

**Thao Lam**

Faculty Mentor: Prof. Jessica Bergner

Academic Unit/Department: School of Nursing & Health Studies

Funding: EUREKA Course

## **Factors Impacting the Varying Management of Mental Health among Older Adults**

*Introduction:* Maintaining good mental health has become increasingly important in society. Generational stereotypes and differences impact the approach to maintaining mental wellbeing. As our population ages, it is important to assess these variances within older adults. Therefore, the purpose of this study was to observe what factors contribute to differences in the management of mental health between older generations.

*Methods:* Data for this study was collected through the conduction of semi-structured interviews. To analyze the collected data, thematic analysis guided by an inductive grounded theory approach was used. A total of 20 interviews were collected from adults aged 50-88. Questions administered during the interviews revolved around personal experiences that may impact individual mental health, thoughts on mental health, as well as how individuals care for their own health.

*Results:* The collected data show that factors such as family, finance, and physical health affect older adult age groups at similar rates. Additionally, personal experiences and changing perceptions by society play a greater role in the approach older adults have in perceiving and handling issues related to mental health.

*Conclusion:* This study reveals that there are commonalities in factors that impact the degree to which older adults manage their mental health regarding community and personal life experiences. In contrary to general belief/stereotypes, older adults hold more responsibilities than presumed and a work-life balance is sought through social and leisure activities.

## **Rami LeRoy**

Faculty Mentor: Prof. Jessica Bergner

Academic Unit/Department: School of Nursing & Health Studies

Funding: EUREKA Course

### **Generational Views & Health Care**

#### Introduction:

Generational divides are frequent as society, media, government, education, and common views change. These differences in values and morals affect various aspects of life. As individual's views change so does their behavior and choices. Therefore, the purpose of this study is to compare the differences of generational views and how those views affect their well-being and health care.

#### Methods:

A total of 29 interviews were collected with ages ranging from 50s to 80s. Political views and health care related topics that interwind with political views such as sex educations, vaccines, government involvement, mental illness, and insurance were assessed. Data was analyzed using a thematic analysis guided by an inductive grounded theory approach.

#### Results:

Findings from this survey showed that with age the majority general population typically answered with similar responses. Majority held conservative views with responses to following questions that fell in line with that political group.

#### Conclusion:

While our findings supported that older generation did typically hold conservative views, there was a pattern that broke some common stereotypes. Unlike the stereotype, the majority of the older population were for taking vaccines and were pro health and sex education for the younger generation. With the knowledge learned from the responses we can improve health care provided to these individuals and work towards reducing stereotypes and discrimination that prevents these individuals getting proper care.

## **Sarah Love**

Faculty Mentor: Prof. Jessica Bergner

Academic Unit/Department: School of Nursing & Health Studies

Funding: EUREKA Course

### **The Health Effects of Aging in America**

*Introduction:* Older adults in the United States may face, health and physical challenges. Such challenges are often overlooked by health professionals and society. Therefore, the goal of this study is to understand how the older population perceives these challenges of growing older and how they adapt or overcome them.

*Methods:* A 10 question interview was conducted with five older adults ranging from age 57 to 93 years old. Questions inquired about age discrimination, challenging physical and mental changes and perception of aging in general. Data was analyzed using thematic analysis utilizing grounded theory.

*Results:* Findings from the study portray negative and positive outlooks on aging. Participants reported that eating healthy and exercising daily has improved mobility and memory and is helpful in mitigating health changes. Several were concerned with mental and physical health challenges and stated the cost of health is a problem.

*Conclusion:* The research revealed that older adults have mixed feelings concerning their mental and physical health and respondents struggled to accept these challenges. Results showed older adults are shifting their perspective about certain physical struggles and are motivated to change their lifestyles to live longer. The findings display older adults are focused on methods to improve health and well-being and are aware of how important it is to maintain mental and physical health. This disproves the stereotype that older adults do not face mental health challenges and do not want to improve their overall health.

## **Tiffany Lowell**

Faculty Mentor: Prof. Jessica Bergner

Academic Unit/Department: School of Nursing & Health Studies

Funding: EUREKA Course

### **Lack of Accessible Information for Older Generations to Improve Personal Health**

*Introduction:* Education on personal health has increased through the years. Many believe that older generations care less about their health. Today, most health information is found online, providing a challenge for most older generations as they didn't grow up with advanced technology. Doctors are quickly guided from patient to patient leaving them with a feeling of mistrust and lack of credibility. Therefore, the purpose of this study is to examine the types of education that older generations receive on their personal health.

*Methods:* 25 interviews were collected through a semi-structured interview guide. Data was analyzed by a thematic analysis guided by an inductive grounded theory approach. Questions inquired about personal preference for information gathering, trust in sources, and desire for more knowledge.

*Results:* Findings from the study suggest that most older generations get their health information online or from family members in the health field. Participants reported a desire to be properly informed on how to maintain personal health earlier and in ways other than diet and exercise.

*Conclusion:* This study provides insight into the education on personal health as someone ages, specifically those that likely struggle with technology. Improving access to information and education on personal health can increase mental and physical health, declining the need for countless doctor visits while aging.

## **Ousman Malik**

Faculty Mentor: Prof. Jessica Bergner

Academic Unit/Department: School of Nursing & Health Studies

Funding: EUREKA Course

### **Perspective of Older Generations Regarding their Health and the Healthcare of the Country**

**Introduction:** In the U.S., surveys have shown that conservatives, on average, are happier than their liberal counterparts and lead healthier lifestyles. Many of these conservatives belong to the older generations which are the main populations that are reluctant to take vaccines and adhere to public safety measures. The purpose of this study is to examine how older generations, based on their age and political ideology, view their health and healthcare in the United States.

**Methods:** The data was collected by interviewing 30 individuals aged 50-99 and recording their responses. These interviewees were anonymous, with only their age being asked along with the ten questions that asked for their opinion over topics such as role of government in healthcare and their own views on their own health and that of the community and society.

**Results:** It was found that a slim majority of interviewees had conservative views. Most interviewees irrespective of political ideology had many complaints about the healthcare system and health issues of the interviewees did not have a direct linear correlation with their age.

**Conclusion:** The results showed that health does not linearly deteriorate with age and that most people from older generations are not necessarily extremely conservative. The younger subset of the older generation (aged 50-65) is disproportionately conservative and reports many health problems, this subset could be targeted in information campaigns to promote better health in the community.

**Audrey Manivong**

Faculty Mentor: Prof. Jessica Bergner

Academic Unit/Department: School of Nursing & Health Studies

Funding: EUREKA Course

**Physical Health Discoveries Leading to Longer Lives**

**Introduction:** As people age, many health issues arise. Most of the main health issues can be prevented, but not all of them. Many people regret not creating certain habits when they were younger, before it was too late. Physical health discoveries have allowed older generations to live longer, and this could be from a simple diet change or a change in social environment. The purpose of this study was to determine how physical health discoveries have developed over the years to help older generations.

**Methods:** 35 people ranging from 50-90 years old were asked open-ended questions about their lifestyles, and habits that have allowed them to live the way they do. Data was analyzed using thematic analysis guided by grounded theory.

**Results:** Study findings suggest that many people believe a healthy diet and an active lifestyle have been the most impacting physical health discoveries. Many individuals felt that the main factors contributing to their current health status were the new technologies to be able to diagnose diseases more efficiently as well as a healthy, active lifestyle.

**Conclusion:** This study provides feedback about how older generations are living a healthier lifestyle allowing them to live longer and maintain a good current health status. Findings highlight that a healthy diet and moderate exercise play a big part in the ability to live a longer life.



## **Kyle Masson**

Faculty Mentor: Prof. Jessica Bergner

Academic Unit/Department: School of Nursing & Health Studies

Funding: EUREKA Course

### **Destroying Stereotypes Associated with Aging and Health**

#### Introduction

One may ask, how does our view of all these different ideologies and opinions change towards treatment and healthcare as we grow older. At a young age, we learned that when we are ill or sick we go see a doctor. As we get older we become aware of the many factors that come into play when considering a physician. It is no longer getting in the car and having our parents take us to whoever but us making many micro-decisions leading to a bigger one. My group and I wanted to learn what older generations prioritize when considering a physician.

#### Methods

With the use of the software quadratics, my group was able to create a survey to conduct our research. In the survey, our group asked an individual in their 50s, 60s, 70s, 80s, 90s 12 open-ended questions. The questions required participants to compare peers and themselves whether they prioritize quality or cost of healthcare.

#### Results

Our data showed that most people observed prioritize the quality of healthcare over cost. 17 chose quality over cost. 7 said cost. With 2 participants mentioned both.

#### Conclusion

In terms of improving health and awareness and destroying stereotypes, I would mention the strong use of marketing drugs. Every time we watch tv whether we are shown an older individual being the actor for the drugs. This gives a false narrative that older people need medications much more than younger. This is not the case as some individuals in our study said they take no prescription meds, even though they are much older than others. The majority of the individuals did indeed believe that quality is much more important compared to the cost. Most individuals want the best care in order to keep themselves healthy. However, the cost is always something to think about.

## **Hanna Mattox**

Faculty Mentor: Prof. Jessica Bergner

Academic Unit/Department: School of Nursing & Health Studies

Funding: EUREKA Course

### **Perspectives on Gender Roles in Healthcare with Older Adults**

*Introduction:* Gender roles in America continue to change daily, especially in the healthcare setting. With gender role changes in everyday life and healthcare, different perspectives can arise, especially those of older adults in our society. Therefore, the purpose of this study is to discover and examine the generational differences for changing gender roles in healthcare.

*Methods:* Twenty-five older adults ages 50-90 years old were interviewed. The data collected included age, gender, and responses to 10 open-ended questions regarding gender roles in healthcare. Questions related to feelings and opinions on new societal changes and standards. Data was analyzed using thematic analysis guided by an inductive grounded theory approach.

*Results:* Findings suggest that age and gender impacted question responses. The younger interviewees, specifically women, were more open-minded to new gender roles in healthcare while the older adults out of the group were more closed-minded. About half of the female responses showed that gender roles do not have too much effect on their preferences. This differs from the male response. The males were had more of an opinion when it comes to gender roles in healthcare.

*Conclusion:* This study provides a look into the older adult's opinions and outlooks of healthcare and the different gender roles in the United States. Overall, the study illustrated how older adults in our society feel about the changing gender roles and how it affects their own healthcare preferences and needs.

## **Evan McDaniel**

Faculty Mentor: Jessica Bergner

Academic Unit/Department: School of Nursing & Health Studies

Funding: EUREKA Course

### **The Effect of Retirement on Aging**

**Introduction:** Retirement is often viewed as a basic right that everyone has. In reality, retirement is not granted to people automatically and requires work to be achieved. Retirement requires planning mentally, physically, and financially. The goal of this study was to uncover that retirement along, with planning for it, is not an easy task; Retirement might affect people mentally, physically, and financially.

**Methods:** 25 interviews of participants aged 51 to 95 were conducted. The semi-structured interview consisted of questions about retirement lifestyle and planning along with the effects it has on individuals. A thematic analysis guided by an inductive grounded theory was used to analyze data.

**Results:** The studies have shown retirement and planning for it can affect an individual negatively if they are not prepared for it. Variety of different responses were received, but they all seemed to show that planning for retirement as much as one can, will have a positive impact on an individual during retirement.

**Conclusion:** The data show that the best thing one can do is prepare to have a successful retirement. It is beneficial to see the affect that planning has on retirement. To promote a successful retirement for more people, future studies should be emphasized on the benefit planning for retirement has on retirement itself.

## **Morgan McLaughlin**

Faculty Mentor: Prof. Jessica Bergner

Academic Unit/Department: School of Nursing & Health Studies

Funding: EUREKA Course

### **Does an Increase in Age Cause Changes in the Way Patients are Treated?**

**Introduction:** As the population ages it is important to understand if, and how, prescribing practices, satisfaction, and informed consent differ for older patients. Past research leaves a grey area with varying results, but a theme has emerged suggesting age, health status, and satisfaction are correlated. The purpose of this project is understanding older patients' perceptions of changes in prescribing practices, satisfaction, and informed consent as they have aged.

**Methods:** Participants were collected via quota sampling, with 5 individuals in their 50s, 60s, 70s, 80s, and 90s. Due to difficulty recruiting patients in their 90s the final sample consisted of 6 individuals in their 50s, 5 in their 60s, 5 in their 70s, 6 in their 80s, and 3 in their 90s. Participants were interviewed with 10 questions developed to determine perceptions of treatment in healthcare related to advanced age. A total of 25 interviews were collected. Data was analyzed using thematic analysis.

**Results:** Results showed that patient satisfaction and prescribing practices were perceived as better with advancing age. Informed consent was rated highly by individuals in their 70s, 80s, and 90s.

**Conclusion:** This study further suggests that the areas of prescribing practices, satisfaction, and informed consent are perceived as mostly positive in older adults. Knowing this information allows healthcare workers to offer a better experience to patients.

## **Makayla Mead**

Faculty Mentor: Prof. Jessica Bergner

Academic Unit/Department: School of Nursing & Health Studies

Funding: EUREKA Course

### **Decades Interviews: The Knowledge of Older Generations on Sexual Orientation and its Relations to Healthcare**

**Introduction:** Perspectives on sexual orientation may vary depending on an individual's generation due to growing and changing social norms. Many believe younger generations are more accepting and open to the LGBTQ+ community. Therefore, the purpose of this study is to examine the generational differences in attitudes and knowledge about sexual orientation and the possible health disparities involved.

**Methods:** 25 individuals aged 50-96 were interviewed. Participants were asked demographic questions about their familiarity of different sexual orientations and the impact of minority sexual orientations on treatment in the healthcare system. Questions focused on discrimination, acceptance of sexual orientation over time, comfortability of care from different sexual orientations, and how to destigmatize the LGBTQ+ community in the healthcare setting. A thematic analysis guided by an inductive grounded theory approach was used to analyze data. Group comparisons were made based on participants' age decade (50s, 60s, 70s, 80s, 90s).

**Results:** Participant responses varied across age groups. Overall, there was more acceptance, understanding, and comfortability with the variety of sexual orientations and their implications in healthcare with the younger of the older generations (50s, 60s, and some 70s).

**Conclusion:** This study provides insight on the generational differences on sexual orientation and its relations to healthcare. A future research study may be done on how younger generations can make a brighter future for the LGBTQ+ community in healthcare.

## **Alyssa Mesh**

Faculty Mentor: Prof. Jessica Bergner

Academic Unit/Department: School of Nursing & Health Studies

Funding: EUREKA Course

### **Older Generations Perceptions of Technological Advancements and Barriers impacting Everyday Life and Healthcare Systems**

**Introduction:** Technology has changed the way we purchase products, access medical records, and receive medical care. As people's demands and lifestyle change, the demand for advancing the type of technology we use is high. The purpose of this study is to inspect technological advancements impact on aging adult's everyday life and healthcare.

**Methods:** 25 participants were recruited via quota sampling to interview 5 participants from each age group: 50s, 60s, 70s, 80s, and 90s. Participants shared what they thought about technological changes and how they affect our healthcare systems and who benefits and how they have drawbacks. The interviews were analyzed via thematic analysis guided by grounded theory.

**Results:** Most participants focused on changes related to the Covid-19 pandemic and staying informed on that. Participants use technology to research what they need to make sure they are updated on how Covid-19 could affect them. Most participants shared positive perceptions about how social media connects them with others and news.

**Conclusion:** This study provides insight into technological advancements and how they've improved our lifestyles and how it also affects parts of our healthcare system. It helps your experience with older generations, they must adapt and make it part of their lifestyle. There have been benefits like having faster and easier access to information and it will make it better for patient care.

**Ben Mings**

Faculty Mentor: Prof. Jessica Bergner

Academic Unit/Department: School of Nursing & Health Studies

Funding Source: EUREKA Course

**How are Conservative Beliefs Related to Wellbeing**

This study was conducted to analyze older adults between the ages of 50-90. Further more this study is used to look at if there is any correlation between political beliefs and overall health. The method used to conduct this study was an interview where a total of ten questions were asked. The questions used were strategically selected to gather our data that we needed to come to a conclusion. The questions included anything from political views, opinions on sex education in school, and personal wellness questions. After gathering the responses we saw that much of the data was related to their political beliefs. While the conservative interviews wanted to be left alone by the government and wanted limited sexual education in school. The liberal side was for the government being involved in health decisions like vaccines and for sexual education. There were things both parties had in common like the need for mental health support and the government assisting the less fortunate. In conclusion there is a correlation with political choices and overall health beliefs. Although we found no correlation with political beliefs and actual physical or mental health.

## **Sasha Mitton**

Faculty Mentor: Prof. Jessica Bergner

Academic Unit/Department: School of Nursing & Health Studies

Funding: EUREKA Course

### **Social Media, Technology and Older Adults**

**Introduction:** New technology devices are constantly taking the United States by storm. This has led to some fascinating research ability. Researchers are able to see if there are any technology/social differences in older generations. Therefore, the purpose of this study is to examine the generational differences in attitudes and preferences about social media and technology advancements.

**Methods:** Participants aged 50s-90s were interviewed for this study. The interviews were concluded in person or some over the phone. There were 10 interview questions in total, and all were open ended. A thematic analysis guided by an inductive grounded theory approach was used to evaluate the data.

**Results:** Findings suggest that different generations have the same attitude and preferences about social media and technology advancements. Most felt connected with long distance family members by technology. Some felt as if technology and social media bring out negative aspects in life.

**Conclusion:** This study provides clarity on how different generations are affected by social media and technology. It shows in depth that social media and technology can be better in terms of health. There can be more research done on what specific things that can be done so technology can advance but other generations are not affected as they are not.



**Amy Mohrmann**

Faculty Mentor: Prof. Jessica Bergner

Academic Unit/Department: School of Nursing & Health Studies

Funding: EUREKA Course

**The Impact of Health Discoveries on Aging Generations.  
Are you headed down a successful aging path?**

There's constant debate about how to age in a healthy manner. Over the years many health advancements have come to fruition. There have been advances in medicines, wellness plans, vaccines, and many other areas of health care. Many studies claim to link health technology to increases in quality and quantity of life in older adults. The purpose of this study is to examine older adults' perception of factors that impact healthy aging.

23 participants aged 50 to 80 were interviewed using 10 items developed to assess their perception of health discoveries and different aspects of one's health. Questions discussed virtual appointments, health status, activity level, among other health aspects. Once the information was gathered, common themes were found using thematic analysis.

The results showed the two factors of healthy aging are physical activity and diet. Physical activity and diet can change as one ages, but the importance does not waver.

Findings have implications for educating all ages on healthy lifestyle factors. With this information, medical professionals can assist older patients with making wise decisions towards their health to have a successful aging process. Future researchers may work to determine what types of exercise and diets are beneficial to certain people.

## **Ayla Nguyen**

Faculty Mentor: Prof. Jessica Bergner

Academic Unit/Department: School of Nursing & Health Studies

Funding: EUREKA Course

### **Polypharmacy and Informed Consent: Perspectives from Aging Patients**

*Introduction:* Polypharmacy and informed consent are two significant issues in geriatric medicine. Polypharmacy is common in geriatric patients. Excessive use of medications can cause adverse effects that may go unnoticed. Additionally, ageism and communication barriers can affect informed consent in older patients. The purpose of this study is to examine the perspectives of aging patients in various decades of life on their perceived medication use and informed consent.

*Methods:* 25 patients aged 50 to 95 years were interviewed using a semi-structured interview guide with 10 open-ended questions. The questions asked about patients' perspectives on their prescription medication use, informed consent, patient satisfaction, and changes in treatment as they have aged. The data was analyzed using a thematic analysis guided by an inductive grounded theory approach.

*Results:* The study found that a majority of patients interviewed expressed that they were prescribed increasing amounts of medication as they aged. There was no significant correlation between age and informed consent, and patients had varying perspectives about their level of understanding of their conditions and treatment.

*Conclusion:* This study demonstrates the prevalence of polypharmacy and varying levels of informed consent in aging patients. A common stereotype is that older patients have a decreased ability to provide informed consent, but the study showed no correlation between age and understanding. Implications of the prevalence of polypharmacy in older patients and factors besides age that affect informed consent in geriatric patients should be explored further.

## **Cadao Nguyen**

Faculty Mentor: Prof. Jessica Bergner

Academic Unit/Department: School of Nursing & Health Studies

Funding: EUREKA Course

### **Impact of Gender Roles on Mental Health and Healthcare Experiences**

*Introduction:* Gender roles are a significant cause of friction throughout various generations, as there are constant shifts in gender expectations throughout the decades. Factoring in how gender roles can have an impact on an individual's health, specifically their mental health, is prevalent to study to understand the extent of gender expectations, and whether they are for better or for worse. Additionally, examining how gender roles influence medical interactions is important in examining the prevalence of gender expectations. Thus, the purpose of this study is to examine the intersections of gender roles, mental health and impact in the healthcare sphere.

*Methods:* 5 participants were interviewed in total. Participants were collected via quota sampling distributed across different age groups spanning from 50-90. Ten questions were created to gain insight into the participants' viewpoints on gender roles and healthcare. Questions pertained to their individual experiences and expectations with healthcare personnel, or how gender expectations affected their mental health. The data was analyzed using thematic analysis to view common viewpoints across participants to gauge the opinions of older adults.

*Results:* Findings were split between positive and negative impacts of gender roles. Most participants agreed that women should work outside of the home and that society was progressing in terms of gender inclusivity.

*Conclusion:* Contrasting with the stereotype, a large majority of older adults' value "modern" gender roles compared to more traditional ones, which destigmatizes the view of older adults rejecting modernity. Future studies could focus on the barriers based on gender.

## **Nhi Nguyen**

Faculty Mentor: Prof. Jessica Bergner

Academic Unit/Department: School of Nursing & Health Studies

Funding: EUREKA Course

### **Mental Health & Older Adults**

Mental health often occurs in older adults aged 55 and older. Many internal and external factors contribute to older adults' mental health. Poor mental health can negatively affect older adults' life, thoughts, and actions. It is urgent that caregivers and older adults recognize mental health challenges and syndromes to prevent further complication, diseases, and reduced quality of life.

In order to conduct this research project, 20 participants among four age groups (50's, 60's, 70's, 80's) were interviewed. Demographic data was collected. Questions targeted common factors that lead to mental health challenges and managing mental health. Data was analyzed using thematic analysis guided by grounded theory.

Participants reported that the internal and external factors that contribute to mental health are family, peers, cultural norms (belief and ideas), lifestyle, biological, experiences, community, and environment. Older adults involve in daily activities, communicated, stay positive to minimize the effectiveness of mental health.

Poor mental health impacts older adults' emotions, thoughts, and actions. Mental health is not only inherited, but also effected by our environments. Living positive, engage in daily, activities, having an open mind, and interacting with others allow older adults to manage their mental health. In the future, researchers may study how mental health differs between older and younger generations.

## **Emma Odell**

Faculty Mentor: Prof. Jessica Bergner

Academic Unit/Department: School of Nursing & Health Studies

Funding Source: Eureka Course

### **Generational Financials in Relation to Affordability of Health Care**

**Introduction:** In the United States of America over half of older adults experience financial insecurity or live in poverty. Financial insecurity can lead to increased deterioration of health due to fear of the costs of receiving care. The purpose of this study is to examine the generational differences between the affordability of health care with financial disparities in childhood.

**Methods:** Individuals in age groups of 50s, 60s, 70s, 80s, and 90s were recruited via quota sampling resulting in 25 interviews. The themes of our interviews were financial situations as a child, current financial situation, and experience with health care as a child and currently. Thematic analysis guided by grounded theory was used to analyze data.

**Results:** Findings suggest that having insurance growing up, prescription affordability, believing health is important, and experiencing food scarcity were not affected by age. Interestingly, age had implications for getting annual health exams. After the age of 80, there was a significant decrease in reported annual oral, eye, or physical exams.

**Conclusion:** Age was not a predominant factor for medical insurance in youth, experienced food scarcity in youth, or if they were able to afford prescriptions in youth. Knowing this can help narrow down what causes the high rates of poverty in older adults. Future research should ask more specific questions about medical debt or treatment avoidance due to potential costs.

## **Sydney Reid**

Faculty Mentor: Prof. Jessica Bergner

Academic Unit/Department: School of Nursing & Health Studies

Funding: EUREKA Course

### **Attributes the Older Generation Prioritizes When Considering Physicians**

*Introduction:* The healthcare system plays a significant role in the treatment and care of the older population. As the population ages, the need for more healthcare attention increases. Due to this, older individuals are looking for healthcare providers that will supply effective treatments. As health may become more fragile as we age, it is important that this population receives proper care. This study sought to uncover how older adults choose their physician based on specific valued attributes.

*Methods:* 27 participants ranging from ages 50 to 90 were interviewed. Questions focused on the opinions of the healthcare system regarding: cost, experience, and satisfaction. Data was evaluated using thematic analysis guided by a grounded theory approach.

*Results:* Findings suggest that elders look for a physician that prioritizes the patients needs, can communicate clearly, convenience of appointments, and actively listens to their concerns. Cost of medical expenses is a large concern for this group; despite this, quality of medical care is prioritized. There is slight hesitation with the trust of new technology.

*Conclusion:* This study provides insight into improving the American healthcare system by collecting data for what the older generation values when considering a physician; this can allow physicians to meet the expectations of this generation. Common stereotypes such as closed-mindedness or inability to comprehend medical advice have affected the doctor-patient relationship. Insight on how the older generation views healthcare can improve internal function.

## **Austin Rexroad**

Faculty Mentor: Prof. Jessica Bergner

Academic Unit/Department: School of Nursing & Health Studies

Funding: EUREKA Course

### **If you're happy and you know it, take your pills.**

*Introduction:* Discrimination, whether we like to believe it or not, is ever prevalent throughout our society, but of most concern in our healthcare system. Unfortunately, those who rely on that system the most tend to be the most at risk for discrimination. It can be overwhelming to the patient and have devastating effects on their health. The purpose of this study is to examine how prescribing practices, patient satisfaction and informed consent differ by age among older adults.

*Methods:* To determine these results, 25 interviews were conducted through a semi-structured interview guide inquiring about satisfaction of treatment by providers, the level of engagement in their treatment plans and the perceived effectiveness and satisfaction of prescribed medications. Results were reviewed using a thematic analysis guided by an inductive grounded theory approach.

*Results:* Adults aged 50 and older are highly subject to age discrimination in health care. Most adults over the age of 70 are generally less educated and less satisfied with the treatment and care they are receiving from providers.

*Conclusion:* Older adults who rely on medical care more often tend to take action into their own hands. Age discrimination is steady and prevalent in adults aged 50 and older, not just retirement age and older. Future studies may assess contributing factors to older adults' discrimination. Such studies may focus on providers' age in relation to satisfaction and education and assess for discrimination in middle-aged adults.

## **Taylor Rae Russell**

Faculty Mentor: Prof. Jessica Bergner

Academic Unit/Department: School of Nursing & Health Studies

Funding: EUREKA Course

### **Patient Satisfaction in Older Adulthood**

There are many factors that can cause increased healthcare utilization in older adults. Discrimination is likely one factor involved with older adult utilization of healthcare. Their concerns may not be treated as seriously as younger patients, and their pain may be associated with their old age and not a serious health condition. Additionally, older adults may be seen as closer to death, leading to less care. This study sought to find out more about prescribing practices, patient satisfaction and informed consent in older adults.[JB1] [JB2]

In order to collect data for this study a list of ten questions were asked to 27 participants all aged 50-90 years old. The interviews were conducted through a semi-structured interview guide. The questions were all related to prescribing practices, patient satisfaction and informed consent in older adults. The data was analyzed via thematic analysis guided by grounded theory.

The data from the interviews have shown that most of the patients do believe that they have a very active role in their own healthcare. The data has also shown that most of the older adults feel like they get treated the same or even better than younger patients. When the subjects were asked about their medication, they felt that they were not over prescribed medication.

From this study I have found that the older population is not as discriminated as society believes they are. Future studies should be focused on how younger patients feel about how doctors explain things to them and how the feelings of younger patients and older patients compare.



## **Corby Schmitz**

Faculty Mentor: Prof. Jessica Bergner

Academic Unit/Department: School of Nursing & Health Studies

Funding: EUREKA Course

### **Older Adult Priorities When Deciding on a Physician**

**Introduction:** Many generations have different viewpoints when it comes to choosing a physician for their health care needs. Some of these viewpoints include cost, quality, trust, relationships, and many more. Throughout this research, we studied what factors influence adults 50 and older prioritize when they are seeking a physician.

**Methods:** The data collected points out many similarities and difference between generations. Within our research we interviewed 27 individuals in their 50's, 60's, 70's, 80's, and 90's using open ended questions. In the interview process we asked questions inquired about the cost, quality, and relationship perceptions older adults have about their providers. Thematic analysis grounded theory was used to analyze responses.

**Results:** The thematic analysis provided information for all the interview responses. The 50-year-old generation had the same response as the 90-year-old generation when it came to the quality versus the cost of health care. Many of the participants stated that they are more concerned about the quality over cost when they are seeking a physician.

**Conclusion:** Viewpoints varied in the sample. Individuals across generations had similar concerns and viewpoint when it came to health care. This research breaks the stigma that many older generations prioritize the cost of health care to where they consider they consider cost to be ore important than quality. This new knowledge goes to show that a lot of today's health care ideals have been passed down from older generations.

**Fatima Shahab**

Faculty Mentor: Prof. Jessica Bergner

Academic Unit/Department: School of Nursing & Health Studies

Funding: EUREKA Course

## **Social Media, Technology, and Health: The Perspective of Older Generations vs Society**

**Introduction:** People assume the significant gap in technology and social media use between younger and older adults is because older adults are incapable of using online devices or find them too dangerous. However, research shows that is not necessarily the case. Oftentimes, lack of information about how to use these tools discourages older adults from trying to learn. The purpose of this study was to investigate the attitudes of older generations regarding social media/technology and the extent to which their perspectives align with common societal beliefs.

**Methods:** 25 individuals ranging from 50-90 years old were interviewed with 10 questions regarding personal social media/technology use and opinions. Interviewee responses were then recorded and reviewed through thematic analysis guided by inductive grounded theory approach.

**Results:** Findings showed that while older generations acknowledge the negative health effects of excessive technology/social media use, most also believe that their use in moderation for ease in communication, information, and work purposes has positively impacted their health, especially during the pandemic.

**Conclusion:** The results highlight the inaccuracy of ageist misconceptions regarding technology/social media use among older generations. Older adults regularly use these tools to help them and those that do not, often don't know how to. This study raises awareness about the true relationship between older generations and technology/social media, and also encourages further studies to find solutions to support older individuals who are interested in learning how to use these online resources

**Adnan Shaik**

Faculty Mentor: Prof. Jessica Bergner

Academic Unit/Department: School of Nursing & Health Studies

Funding Source: Eureka Course

**Older Adult Patient Attitudes Towards Healthcare**

**Introduction:** The older adult patient population is in a unique situation within medicine. Increased age may be related to increased interaction with healthcare providers and the broader healthcare system. These interactions often result in polypharmacy, absence of informed consent, and mistreatment by physicians. Due to these practices, older adults can be subject to different malpractices. Therefore, this study aims at analyzing the attitudes of geriatric patients towards their health providers and the broader healthcare system.

**Methods:** 25 participants between the ages of 50 and 95 were interviewed using a questionnaire comprised of ten open-ended questions. Responses were recorded anonymously by the researchers. The data was analyzed using thematic analysis guided by grounded theory.

**Results:** Some major findings include as age increased, patients reported worse treatment by their healthcare providers. There was also a theme found between individuals aged 70 and older and a lack of education and satisfaction with their care and treatment.

**Conclusion:** This study can be expanded upon with larger sample sizes in order to further analyze the relationship between age and healthcare practices. Future research can focus on particular issues within healthcare practices such as informed consent and use larger sample sizes along with outcomes to further establish the relationship between a lack of informed consent and patient satisfaction/health.

## **Elijah Simpson**

Faculty Mentor: Prof. Jessica Bergner

Academic Unit/Department: School of Nursing & Health Studies

Funding Source: EUREKA Course

### **Viewpoints From the Older Generation on Sexual Orientation in Healthcare**

**Introduction:** Sexual orientation is something that may be controversial for the older generation. There may be implications for growing up in a time where there was less recognition and acceptance of minority sexual orientations. Stereotypes often suggest that older adults are less accepting of change. The purpose of this study is to examine the generational differences on perspectives and attitudes about different sexual orientations in healthcare. Furthermore, we sought perspectives of the older generations on sexual orientation in healthcare.

**Methods:** 25 participants between the ages of 50 and 95 were interviewed using a questionnaire comprised of ten open-ended questions. Responses were recorded anonymously by the researchers. The overarching topics of our questions were have they felt discriminated against due to their sexual orientation and are they aware that this goes on with others. The data was analyzed using thematic analysis guided by grounded theory.

**Results:** Findings suggest that over half of the interviewees were unaware of discrimination due to sexual orientation. Additionally, most of the interviewees were heterosexual and didn't know others that felt discriminated against.

**Conclusion:** People are often oblivious to the struggles that those with minority sexual orientations face when it comes to healthcare. This fits with research that majority members are often ignorant to discrimination. However, it appears with increased education surrounding sexual orientation, older adults disagree with discrimination. Further studies may work to implement effective training programs for healthcare employees to address the issue of discrimination.

## **Emma Sinclair**

Faculty Mentor: Prof. Jessica Bergner

Academic Unit/Department: School of Nursing & Health Studies

Funding: EUREKA Course

### **He/Him/Healthcare: Generational Shifting of Gender Roles**

**Introduction:** Every person plays a significant role in society from birth to death, yet the roles assumed at different stages of life vary quite significantly. Today's gender roles are beginning to break the mold of traditional norms while simultaneously being reshaped by culture. Therefore, the purpose of this study is to examine the generational shift in gender roles between men and women and discover the bigger picture as to why and how this shift is occurring.

**Methods:** My group prepared 10 interview questions exploring different concepts within our topic. We then interviewed a total of 25 elderly adults ages 50-90 years using a semi-structured interview guide. Majority of our interview questions focused on stereotypes of gender roles within health care, and the way our interviewees' pre-conceived notions regarding this topic affected their satisfaction of care. We then analyzed our data using a thematic analysis guided by an inductive grounded theory approach.

**Results:** We found that there was very little variation in our participants' perceptions regarding gender roles. We concluded that there was some differing of opinion between people aged 50 and 90 and males and females, which can be attributed to personal values and lifestyle.

**Conclusion:** While most of our findings aligned with stereotypical gender roles, there were also a handful of interviewees that voiced opinions contradictory to societal gender standards. Future research investigating the way childhood experiences can shape one's perception of gender roles would provide more answers regarding the psychology behind shifting of gender roles.

## **Tyler Smith**

Faculty Mentor: Prof. Jessica Bergner

Academic Unit/Department: School of Nursing & Health Studies

Funding: EUREKA Course

### **Differences in Health Information Access Among Older Generations**

**Introduction:** The ways we educate people are always changing over time. Many older adults today are struggling with chronic conditions due to a lack of health information (Abdi et al., 2019). This study sought to uncover the kinds of health education older generations need in order to age successfully.

**Methods:** For this study, 25 older adults ranging in ages from 50-84 were interviewed using ten questions about health information gathering. This included where they get information, what kind of information they look for, and if they experience difficulty with finding certain information. We used a thematic analysis guided by an inductive grounded theory approach to synthesize the data.

**Results:** We found that 72% of older adults used healthcare professionals to obtain information and 64% used the internet. We also found that 85% of our participants had a health-related issue that they wish they were educated on sooner and they began to start conversations about health on their own in their 60s.

**Conclusion:** As people age, they tend to care more about their health. They don't have difficulties finding health information but the lack of health education when they are younger may make it harder to deal with chronic health issues as they age. Future studies may investigate this and see if chronic disease rates are lower in people who are taught proper health education at a young age.

## **Tyesha Smith**

Faculty Mentor: Prof. Jessica Bergner

Academic Unit/Department: School of Nursing & Health Studies

Funding: EUREKA Course

### **How Have Physical Health Discoveries Developed Over the Year to Help Older Generations?**

**Introduction:** The primary purpose is to evaluate and to provide a more in-depth overview of how physical health plays a part in how quickly our bodies heal and recover. As we grow older and pass through new generations, we become more aware of how much maintaining physical activity truly effects our well-being. As our body ages it becomes more prone to health issues and it is important to build the body up. New generations have started to incorporate more physical activity into their daily lives to help keep their body motivated and ahead of any issues that might come with age. The specific focus of our study is to determine how each age group interprets what physical activity is and how much they incorporate into their daily lives. We want to determine if new advancements in medicine are beneficial to our older generations and encourage an improved quality of life.

**Method:** In order to provide accurate results, open-ended interview questions were asked to participants in older generations varying in ages within that generation. The interviews were tracked and analyzed in an online database.

**Results/Conclusions:** Study findings suggests that many people incorporate diet changes and some form of physical activity into their daily lives to remain healthy. Respondents discussed how much new health advancements are improving and how they benefit from these new techniques.

**Lisa Tarantola**

Faculty Mentor: Prof. Jessica Bergner

Academic Unit/Department: School of Nursing & Health Studies

Funding: Eureka Course

## **The Older Generational Views of the Growing Acceptance of Sexual Orientation**

**Introduction:** The world has changed drastically within the last fifty years. Ideologies and opinions change as people grow and become more accepting of those who are different from themselves. With this, the purpose of this experiment was to obtain the knowledge of generational differences on the attitudes of people in different age groups towards those of a different sexuality and their experiences in healthcare.

**Methods:** 20 participants were collected via quota sampling. Groups were separated by decade with 50s, 60s, 70s, 80s and 90s. Participants were interviewed using a 10-item open-ended semi-structured interview. Each question was based around how the individual felt about different sexualities in healthcare, and their knowledge on healthcare discrimination due to sexual orientation. Data was analyzed using thematic analysis guided by grounded theory.

**Results:** Findings suggests there are some similarities and differences between the age groups and their views on the growing acceptance of different sexualities than straight. 50 and 60 had more similar answers to the questions while 70, 80 and 90 had more similarities between them.

**Conclusion:** With time and acceptance, each generation is coming to find common ground when it comes to LGBT and healthcare, and it's important because we need to work together and settle on solutions that have a chance at ending discrimination and negative thoughts in the field that is most important for the health and safety of everyone.



## **Sarah Thalken**

Faculty Mentor: Prof. Jessica Bergner

Academic Unit/Department: School of Nursing & Health Studies

Funding: EUREKA Course

### **How Have Financial Challenges Been Presented and Managed in The Lives Of Older Adults**

Older adults are a diverse population with sub-groups, including gender, sex, and racial minorities, who may face greater financial difficulty. There may be differences in spending and necessities for older adults. Some believe older adults are worse off financially, while others believe older adults are more financially stable. The purpose of this study is to examine the generational differences in cost of care and quality as they age.

35 interviews were collected through from individuals in age ranges from 50 to 80 years old, with different genders and ethnicities. Groups were formed by decades. Questions inquired about retirement timelines and the cost of care or types of insurances. Data were analyzed using thematic analysis guided by grounded theory.

The results found that clumped together, the same age groups, regardless of gender or ethnicity had the same attitude towards finances and healthcare access. The older-old generations more financially stable than did the younger-old ones. There were overarching themes of starting retirement after they got their first high-paying job, or in their 20's, to the same level of insurance coverage or forms of savings used. Meaning that collectively, despite the year and economic climate at which they were 20, most of them stated that they began saving around the same age.

The stereotypes that older generations are worse off than expected was not as prominent as once thought. For future studies, a closer look at the jobs the interviewees had, as well as the economic upbringing they had could be beneficial to this study.

## **Sydney Thomas**

Faculty Mentor: Prof. Jessica Bergner

Academic Unit/Department: School of Nursing & Health Studies

Funding: EUREKA Course

### **Health Interpretation of Older Adults**

*Introduction:* As our population ages, one concern that needs to be addressed is how one can age successfully by trusting physicians' advice, nutritional information and exercising. It is important for our older population's prosperity that they understand how to age in a healthy way. Obtaining knowledge about one's health as they age is crucial for quality and quantity of life. Therefore, the purpose of this study is to examine the health and wellness education that older adults receive to age successfully.

*Methods:* To explore how older adults obtain knowledge of their health while aging, 25 participants ages 51-89 were interviewed with a semi-structured interview guide. Questions assessed for problems with nutritional information, trusting physicians' advice and exercising. The interviews were then analyzed using thematic analysis guided by an inductive grounded theory approach.

*Results:* It is quite noticeable with our survey that the majority of concerns from older generations come from lifestyle changes and problems trusting or listening to their doctors/physicians. Older adults reported that they are self-taught on their health education through their own research via books and the internet.

*Conclusion:* Whilst the older generations do not often take doctors recommendations to heart nor trust their doctor, there are certain platforms that could be used for older adults to find a doctor that they do like and trust enough to follow their advice. By using the internet, older adults could use telehealth to find practicing doctors in their area and possibly get to know them well enough to follow their advice to improve their education of health in order to age successfully.

## **Sebastian Torres**

Faculty Mentor: Prof. Jessica Bergner

Academic Unit/Department: School of Nursing & Health Studies

Funding: EUREKA Course

### **The Evolution of Health-Related Discussion as People Age**

With health information and health-care experience continually evolving, generational experiences tend to follow suite. As age increases, the experiences obtained in healthcare increase along with discussion about one's health. Health-related information received should continue to focus on how to prolong quality of life. Therefore, the purpose of this study is to find how health information and experiences are received by the older population. For this study, information was received through interview and recorded by ten question survey. A total of 25 participants were interviewed falling between the ages of 50-84. Many of the questions followed three overarching topics: health discussions, obtained or received information, and personal experience and/or opinion. Data was analyzed using a thematic analysis guided by grounded theory approach. The survey results showed that 52% of the participants received relatively similar recommendation by professionals, eat healthier, exercise more, and take vitamins regularly, and had a form of information given to them (person-person discussions and/or paper handouts). Roughly 30% of participants preferred self-education over regular health visits, finding them burden-some and potentially unreliable due to ever-evolving information. Although the need for health visits may increase along with age, the want for independence by the older population continues. Information received by health professionals is, in large part, similar among older individuals, which can lead to decreasing trends of in-person health visits if self-education continues to be a preferred source of information. This trend could be further supported by the overwhelming amount of information provided through the use of technology.

## **Aishani Vengala**

Faculty Mentor: Prof. Jessica Bergner

Academic Unit/Department: School of Nursing & Health Studies

Funding: EUREKA Course

### **Perspectives on the Mental, Physical, and Financial Determinants of Aging and Retirement**

*Introduction:* The biopsychosocial approach is an effective way of learning about the perspectives of those going through aging and retirement. Retirement entails balancing changes in lifestyle and personal health—changes that are often overlooked. The purpose of this study was to analyze all the effects of retirement and aging in mental, physical, and financial subcategories in men and women aged 50 and above.

*Methods:* In order to analyze these points, 27 open-ended interviews were conducted with people in age categories ranging from 50s to 90s. The interviews consisted of 10 questions that inquired about any changes the individual may have experienced, whether mentally, physically, or financially, and how those changes affected them. The interviews were recorded using Qualtrics software and analyzed using thematic analysis guided by grounded theory.

*Results:* Responses from the interview indicated either positive or negative overall outlooks on aging. People discussed various points that contributed to their outlooks, such as a decline in physical ability, potential financial stressors, and occasional memory loss.

*Conclusions:* This study provided insight into the challenges that arise with retirement and aging. It allows for understanding the ways elder populations want or do not want to be assisted, and how different people have different ways of enriching their changing lifestyles. By incorporating these opinions into decision-making for assisted living facilities or healthcare facilities, the elder population can be better assisted and adjusted to the challenges of aging.

## **Jaquie Villanueva**

Faculty Mentor: Prof. Jessica Bergner

Academic Unit/Department: School of Nursing & Health Studies

Funding Source: Eureka Course

### **Financial Barriers in Older Generations**

*Introduction:* There are many misconceptions surrounding the financial security within the lives of older adults. Many believe they are economically prepared for retirement, while others believe they struggle to afford expenses. Factors such as medical bills or the use of insurance can greatly affect the reality of this issue. Therefore, the objective of this study is to figure out the types of financial challenges that older adults face and understand how they manage them. We are also interested in the ways that those challenges have impacted their health and well-being.

*Methods:* 25 interviews from older adults ages 50-90 were conducted. Questions focused on the types of financial struggles they have experienced, the resources they use to manage finances, and the impacts of those challenges. Data was analyzed using a thematic analysis and an inductive grounded theory approach.

*Results:* Findings suggest that over half of our interviewees have not faced significant financial challenges nor stress, and nearly all of them use insurance and feel comfortable being retired. We also found that 20% of older adults experienced financial insecurity through medical or housing expenses, and their mental health was negatively affected.

*Conclusion:* Our diverse results show that older adults have been financially impacted in different ways, and most have been economically secure. This contradicts the misconception that all older adults are a certain way regarding their financial security, which allows us to gain a better understanding of the economic realities within these generations.

## **Hana M. Viserio**

Faculty Mentor: Prof. Jessica Bergner

Academic Unit/Department: School of Nursing & Health Studies

Funding Source: EUREKA Course

### **Generational Gaps in Beliefs: Where Do They Differ and Why?**

The purpose of this study is to understand where a divide in ideologies among younger and older generations exist and why. It's important to know what factors have a role in the different beliefs among different age groups. This research allows comparison of different beliefs between all age groups; in both differences and similarities.

As we grow older, we develop our own thoughts and beliefs that can be influenced by our everyday lives. This can create a divide among different generations based on the information people consume and how people were raised and the times they grew up in. The purpose of this study is to understand where a divide in ideologies among younger and older generations exist and why.

A survey was sent to 30 people with ages ranging from 40-90. This allowed our group to analyze the differences and similarities among different generations when they were answering. The survey allowed respondents to answer in their own words and provide additional information to their answers if needed. The survey was based on a semi-structured interview guide.

The results of our study revealed that older generations tended to side with more conservative beliefs and were a majority republican. Many views seemed to align in response with other people interviewed for not only political questions but also overall well-being, healthcare and education choices.

After our findings, it's clear to see that most older generations consider themselves to be conservative and tend to practice in their beliefs. However some stereotypes about how they all think the same is not true based on our survey results. The benefits of this research can show us the ideologies that older generations have and how they can contrast with younger generations' views but could also possibly align as well. Future researchers should find questions that are open ended, but provide text as responses instead of open responses.

## **Sophia Waibel**

Mentor: Prof. Jessica Bergner

Academic Unit/Department: School of Nursing & Health Studies

Funding Source: EUREKA Course

### **Lifelong Health Effects of Childhood Poverty**

**Introduction:** Childhood poverty is an economic issue that is widespread throughout society, and continuously affects individuals daily through each generation. Financial insecurity is an issue that remains in the lives of these individuals until one is capable to obtain the resources to make change in their own life. Financial insecurity has an extensive effect on an individual's health, often without presenting its full capacity until later in an individual's life. The goal of this study is to determine generational differences between the views on importance of health care maintenance and the ability to afford healthcare throughout changes in one's life.

**Methods:** 27 participants aged 57 to 92 were interviewed via structured interview. Data was categorized through thematic analysis guided in grounded theory.

**Results:** Studies found that 50% of the participants claimed to obtain health insurance as a child, and 75-80% of participants stated that health insurance coverage is involved in current stages of life. Consistently, views of health care importance increased exponentially throughout aging in generational studies.

**Conclusion:** The study confirms that health insurance coverage created change in the lives of individuals of whom did not have health insurance as a child. Individuals who obtain health insurance in their current stages of life when they experienced absence as a child found increase in the affordability of medication. These findings also confirmed that the overall wellness of an individual's health improved as maintenance of health care was improved and prioritized. Results are consistent and supported by societal and generational norms.

## **Megan Walters**

Faculty Mentor: Prof. Jessica Bergner

Academic Unit/Department: School of Nursing & Health Studies

Funding: EUREKA Course

### **Healthcare Literacy in Older Generations**

Introduction: Our research group set out on this exploration to discover more about older generations. Ultimately, the question we concluded was this: What kind of health and wellness education do older generations receive to age successfully? This question was born out of curiosity for healthcare literacy for older generations. Methods: 25 participants were recruited via quota sampling, one person from each age group: 50s, 60s, 70s, 80s, and 90s. Data was analyzed using thematic analysis guided by inductive grounded theory. Results: Results indicate that most of our subjects prefer to self-educate when it comes to learning more about their own health and wellness. An interesting observation that we made is that no patterns of ideals are consistent with one specific age group. Conclusion: An important conclusion for our research is to not group older generations together in terms of similarities in thinking and prioritization of health and wellness. Older adults are willing learn and utilize all resources they have to do so to maintain and prolong their health.



## **Taylor Whiting**

Faculty Mentor: Prof. Jessica Bergner

Academic Unit/Department: School of Nursing & Health Studies

Funding: EUREKA Course

### **How Is Physical Health Maintained As We Age?**

**Introduction:** Each generation experiences a new generation of health care. There are constantly new discoveries or inventions or new procedures that change the direction of healthcare. This results in each generation aging differently. As discoveries are made, health care becomes better. Therefore, the purpose of this study is to examine the relationship between aging and new health care discoveries.

**Methods:** A total of 25 people participated in the survey, with each person being born in a different decade, the 50s-90s. A semi-structured interview guide was used to construct the survey that consisted of 10 questions relating to our topic of health discoveries and physical health. The goal of the survey was to collect data on the participants' experiences with medical advances regarding health and how these affected their physical health as they aged. A thematic analysis guided by an inductive grounded theory approach.

**Results:** Our data showed that most people experience a decline in physical activity due to having little time. The biggest health discovery that has impacted physical health while aging is, what foods to eat for a better diet.

**Conclusion:** Overall, the survey concluded that most Americans experience a decline in physical activity as they age. Exercising regularly is important to maintain physical health, so knowing this information can open further discussions on why this happens and how to reverse the problem.

## **Eric Wilkey**

Faculty Mentor: Prof. Jessica Bergner

Academic Unit/Department: School of Nursing & Health Studies

Funding: EUREKA Course

### **Technology's impact on Older Adults**

**Introductions:** The impact of technology on Older Adults is important for the quality of life and lifestyle changes. The purpose is to examine older adults' lifestyle in relation to technology to see whether its better or worst. This study is to examine older generations perceptions of technology's impact on healthcare.

**Methods:** 25 open-ended interviews were conducted to five individuals from each group; groups consisted of people in their 50's, 60's, 70's, 80's, 90's members. Data was analyzed using thematic analysis using the grounded theory.

**Results:** Findings suggest that the older generation views technology as a benefit to their life. They reported that technology has improved their communication, doctor appointments, and health care. Technology was perceived to improve quality of life and performance. More than half of older adults studied, reported that technology had a positive impact on their experience of healthcare during the pandemic.

**Conclusions:** Technology has an overall positive effect on communication, healthcare, and quality of life in older adults. Thus meaning we have to expose more older generations who aren't aware of this technology to get them connected with better healthcare and communication to get a better quality of life as they age.

# **PBHL 158 Public Health Principles**

**Geova Alexander, Sydney Chhiv, Messiah Draper, & Gabrielle Moss**

Faculty Mentor: Dr. Joseph Lightner, MPH

Academic Unit/Department: School of Nursing and Health Studies

Funding: EUREKA Course

## **Cancer Treatment Access and Household Income**

**Background:** Although some types of cancers are decreasing, others are steadily increasing. Breast cancer, prostate cancer, colorectal cancer, and lung cancer has the highest national out-of-pocket costs (Islami et al., 2021). Therefore, household income may affect how soon a patient is able to receive treatment. The purpose of this study is to understand the relationship between self-reported household income and whether a patient has started cancer treatment.

**Methods:** Datasets were used from the CDC Behavioral Risk Factor Surveillance System (BRFSS). Survey participants were asked, “Are you currently receiving treatment for cancer?” and “What is your annual household income from all sources?” Data were collected in 2020 through a national telephone survey in all 50 states and the District of Columbia of over 400,000 adult interviews (CDC, 2021). An independent samples *t*-test was conducted to understand who has and has not received cancer treatment in relation to annual household income.

**Results:** Data suggests that individuals who have received treatment for cancer have a higher income than individuals who have not yet received treatment ( $t = -3.652, p < 0.001$ ).

**Conclusion:** Individuals who have received treatment for cancer are more likely to have a higher income than those who have not yet started cancer treatment. Interventions should focus on greater access to care by helping to decrease out-of-pocket expenses and assist in the ease of insurance use for cancer patients. Lack of insurance as well as difficulty in insurance usage is a barrier to healthcare access for low-income families (Lazar, 2018). Along with insurance, some of the other factors that have been barriers to cancer treatment include maintaining employment which contributes to financial hardship on cancer patients (Tangka, 2020). The rates and cost of cancer is projected to increase with the trend of population increases (Mariotto, et al., 2011). Our findings have negative implications on public health. Cancer treatment could be made more accessible through Medicaid expansion, early access to cancer screening, and allowing mid-level healthcare providers more autonomy to practice in areas with physician shortage.

## **Kristen Ballhurst & Hannah Begulia**

Faculty Mentor: Dr. Joseph Lightner

Academic Unit/Department: School of Nursing & Health Studies

Funding: EUREKA Course

### **Mental Health and Oral Care**

In recent years, there has been a noticeable rise in the number of individuals that are suffering from mental health issues such as stress, depression and anxiety. This is especially true with the rise of the COVID-19 pandemic and the resulting anxiety (Jia et al., 2021). These conditions often result in individuals delaying much needed healthcare. The average individual hasn't been to the dentist within the last year. This could be because of the cost of services, fear of the dentist, lack of proper oral health knowledge throughout childhood and proceeding into adulthood, lack of public health interventions, or mental health problems (Benzian et al., 2011). Mental health care is essential for overall care and is a significant determinant of physical health. People who have experienced a mental health disorder are often vulnerable because of lifestyle and health habits including poor diet, tobacco use and substance abuse (Slack-Smith et al., 2017). The purpose of this study is to understand the association between mental health and oral care in United States adults. Using data from the BRFSS questionnaire we analyzed two questions: 1. The last reported visited dental appointment; 2. The reported use of smokeless tobacco. Smokers were at significantly increased risk for oral pain and related limitations of daily activities, which could lead to mental health decline (Riley et al., 2004). We conducted a Pearson correlation to understand the relationship between mental health and dental care in the United States. There was a statistically significant correlation between mental health and dental care ( $r = .095$ ,  $p < 0.001$ ). There was also a significant but weak relationship between poor mental health days and the use of smokeless tobacco ( $r = -.004$ ,  $p < .001$ ). Interventions should be developed to address both mental health and dental care; However the relationship between mental health and smokeless tobacco is relatively unimportant. Interventions in regards to mental health and dental care should include a mandatory oral examination of people suffering from mental disorders. Adding the right questions about oral health to the general part of mental health diagnostic questionnaires would help to further study the relationship between mental health and oral care/oral diseases (Pitułaj et al., 2019). Future research should be conducted on the correlation of oral health and smokeless tobacco.

**Jamie Ly, Ashley Kanatzar, Kristen Nondorf,  
& Kennady Price**

Faculty Mentor: Dr. Joseph Lightner

Academic Unit/Department: School of Nursing & Health Studies

Funding: EUREKA Course

### **What is the Correlation Between Alcohol Consumption and Oral Health in the 2020 Pandemic?**

Evidence has shown increased alcohol consumption during the COVID-19 pandemic in 2020, and we want to find out the impact this has on individual oral health (Grossman, E. R., et., al., 12/2020). Alcohol is known to alter the biochemical environment within the mouth, and these biochemical changes cause poor oral mucosal integrity, tooth decay, and possibly carcinogenesis. (Priyanka, K., et.al., June 2017.) The purpose of this public health study is to understand the relationship between alcohol consumption and oral health.

Our study provides the data set from the CDC: Behavioral Risk Factor Surveillance (BRFSS): Table of Alcohol Consumption and Table of Oral Health. Our data will come from the recent 2020 questionnaire conducted within the US population. We asked a population sample of 182,000 individuals two questions to measure our independent and dependent variables: (1) our dependent variable: During the past 30 days, what is the largest number of drinks you had on any occasion?; (2) our independent variable: Not including teeth lost for injury or orthodontics, how many of your permanent teeth have been removed because of tooth decay or gum disease?

The end of the study proves higher alcohol consumption is not related to poorer oral health ( $r = -0.03, p < 0.001$ ).

Our hypothesis was to understand the correlation between oral health and alcohol consumption. Our independent variable and dependent variable ended in a positive result. Out of the maximum number of alcoholic drinks, the average number of permanent teeth removed was substantially low. The effect is a negative correlation. This information is minimally significant and research should be focused elsewhere such as the correlation of alcohol and other organ systems, or behavior habits.

**Anthony Roganti, Cynthea Thompson,  
Nathan Nguyen & Canaan Punzo**

Faculty Mentor: Dr. Joseph Lightner

Academic Unit/Department: School of Nursing & Health Studies

Funding: EUREKA Course

## **Mental Health and Income by Race**

### **Background**

The majority of Americans report having some kind of poor mental health (Cite). Depression, anxiety, XXX and XX have been shown to negatively impact overall health (CITE). Racial and ethnic minority groups are more likely to suffer from poor mental health than White populations (CITE) and be more affected by recessions (CITE), unemployment (CITE), and other social determinants (CITE). Therefore, the purpose of this study is to understand the relationship between mental health and income by race among U.S. adults.

### **Methods**

The 2020 BRFSS was used for this study. Mental health was assessed by asking participants how many days during the past 30 days their mental health was not good. Income was assessed by asking XXXXX. Race was grouped as Hispanic, non-Hispanic Whites, non-Hispanic Blacks and non-Hispanic Asians. A linear regression model is used to understand the association between household income and mental health by race.

### **Results**

Results suggest that income has less effect on the mental health of non-Hispanic Whites and non-Hispanic Asians than in non-Hispanic Blacks ( $B = XX, p < 0.00X$ ). .

### **Discussion**

We found that household income doesn't have an effect on mental health. Additioanlly, race may have a differential impact on the relationship between income and mental health. oes The impact of race could be through multiple social determinants such as racism, discrimination, and structural/institutional mechanisms. More research needs to be conducted to investigate how other social determinants affect the mental health of non-Hispanic Blacks.

## **Deion K. Wilson, Ereth Muwanika, & Morgan Wahn**

Faculty Mentor: Dr. Joseph Lightner

Academic Unit/Department: School of Nursing & Health Studies

Funding: EUREKA Course

### **The Relationship Between Ovarian Cancer and Women's Public Health**

There's a correlation of women with ovarian cancer and a poorer quality of life. Through interventions and support groups, it's possible to improve their health. The CDC states you're more at risk if you "have had breast, uterine, colorectal cancer (CDC, 2020). Women with cancer face challenges that are physical and mental. The article *Quality of life and mental health among women with ovarian cancer: examining the role of emotional and instrumental social support seeking* says "Women who currently live with or have experienced ovarian cancer have high physical symptom burden and report significant levels of psychological distress (Hill, 2015)." which affects the general health of women. The article *Women's awareness of ovarian cancer risks and symptoms: analysis of responses to an online survey shows that women ages 40 and older are not well informed* had 1,235 participants answered whether they talked with their doctor about signs and symptoms of ovarian cancer the article stated. "Only 15% of respondents were familiar with **ovarian cancer** symptoms (Lockwood-Rayermann et al., 2009)." In this abstract, we will be looking the correlation between women who have developed ovarian cancer and their quality of life.

#### **Methods**

The data set being used is the BRFSS 2020 questionnaire. Exploring the relationship between ovarian cancer and women's public health. The data was collected through assessing two survey questions. The first one has a pool of people who did and did not have ovarian cancer rate your general health one through five. It goes from excellent all the way to poor. The next aspect examined was out of the women who reported the different types of cancer they had. Then looked especially at the group of women who reported they had ovarian cancer and looked at how they rated their overall health.

#### **Results**

The data collected showed a link between individual with ovarian cancer having a lower general health status in comparison to the general population of women and men. The general health was ranked 1 to 5 excellent, very good, good, fair, and poor. When looking at the women having ovarian cancer, they had a general health mean of 2.99. The health of the general population in the data set, had a mean of 2.44. There wasn't a significant change in the health status of those who have ovarian cancer compared people who did not. But their health takes a toll that is not just the cancer. Including support from loved ones, the mental strain of living with cancer, and anxiety and nervousness.

#### **Implications on public health**

Anxiety and stress aren't always due the lack of support and resources but the knowledge around the disease. The article *The Importance of Participation in Support Groups for Women with Ovarian Cancer* states "Anxiety and stress in patients with cancer can result directly from lack of preparation, information, and explanation regarding the type of treatment and the reason for its administration (Ahlberg & Nordner, 2006)." When you don't understand a diagnosis and treatments related to it you begin to feel disconnected from your health. The article *Loneliness and Psychology Distress in Women Diagnosed with Ovarian Cancer: Examining the Role of Self-Perceived Burden, Social Support Seeking and Social Network Diversity* says notably loneliness has been linked to poorer quality of life and psychological distress in individual's with cancer (Hill & Frost, 2021)." More access to resources and support groups gives them an opportunity to not feel alone. Also, get a better understanding of what living with ovarian cancer means for them and their family.



**PBHL 496 Evidence-Based Public Health  
Capstone & Seminar**

## **Amelia Brady**

Faculty Mentor: Dr. Joey Lightner

Academic Unit/Department: School of Nursing & Health Studies

Funding: EUREKA Course

### **An Examination of COVID-19 Vaccination Rates in Independence, Missouri, and Recommended Vaccination Strategies.**

**Background:** Background: The prevalence of COVID-19 vaccination has been varied by geography, with disinvested areas having lower rates of vaccination. Broad COVID-19 vaccination continues to be an effective means to reducing disease spread and it is crucial to identify areas with low vaccination rates to push for vaccination. Therefore, the purpose of this study is to examine race, ethnicity, age, gender, and the zip code for the residents of Independence, Missouri to determine what populations are receiving less COVID-19 vaccinations.

**Methods:** This was a comparison study conducted with datasets provided by the Missouri Department of Health and Senior Services and the United States Census Bureau. This study included 58,508 Independence, Missouri residents who received COVID-19 vaccinations and 87,839 individuals from the 2018 American Community Survey. Vaccinated residents' race, ethnicity, gender, and zip code was compared to the total population using z-tests to determine if any demographic groups were less likely to be vaccinated against COVID-19.

**Results:** With the significance level set at 0.001, the results indicated that women were more likely to be vaccinated than men (z-test,  $p < 0.001$ ). Minority groups such as American Indians, Native Hawaiians', and Hispanic residents were less likely to be vaccinated than white residents (z-test,  $p < 0.001$ ). Residents aged 18-54 and 85+ were shown to be less vaccinated than residents aged 65-84 (z-test,  $p < 0.001$ ). Residents in zip codes 64050 and 64053, were less likely to be vaccinated against COVID-19 than those in zip code 64055 (z-test,  $p < 0.001$ ).

**Discussion:** American Indians, Native Hawaiian's, Hispanics, Females, and residents aged 18-54 and 85+ were determined to have lower COVID-19 vaccination rates. These populations face socioeconomic barriers that attribute to the lower vaccination rates seen. Barriers such as vaccination misinformation, historical oppression, racial disparities, and mistrust in health care systems. These populations are prime targets for COVID-19 vaccine-acceptance messaging. Recommended vaccination-acceptance messaging includes informational interventions and positive social messaging in each subgroup identified to have lower vaccination rates. Implementing COVID-19 vaccination-acceptance messaging for these populations is one step in increasing vaccination rates for Independence, Missouri.

## **Bryanna Contreras**

Faculty Mentor: Dr. Joseph Lightner

Academic Unit/Department: School of Nursing and Health Studies

Funding: EUREKA Course

### **Evaluation of the Ida Mae Clinic at Uzazi Village**

In the United States, Black women are a historically, underserved population which has led to higher rates of preterm births, low birth weight babies and higher rates of maternal and infant mortality than White women and infants. In Kansas City, Missouri, adverse birth outcomes have consistently remained higher for Black women compared to White women. Obtaining prenatal care early and receiving adequate care is essential in reducing those disparities. The Ida Mae Patterson Center for Maternal and Infant Wellness is a prenatal care clinic designed specifically for pregnant Black women with the goal of eliminating racially embedded health disparities in the community. In this mixed methods study, I evaluated the effectiveness of the Ida Mae Clinic in providing Black women culturally appropriate, quality care to prevent adverse birth outcomes using a “village circle” approach model of prenatal care. Data was collected using electronic health records on postpartum mothers (n=11). Results suggest that women who received their care at Ida Mae were either in their second trimester (14-27 weeks, n=4) or third trimester (28-42 weeks, n=7) when they initiated prenatal care. In addition, many of the babies (n=8) were born below average weight despite being born full term (>37 weeks, n=10). Induction rates were slightly above the national average (27% vs. 25.7%). However, women had low rates of c-sections (18%) and NICU stays (9%), compared to the national average (35.8% and 32.4%, respectively) and all women are currently breastfeeding (100%). The Ida Mae clinic has the unique ability to guide implementation of an appropriate care model for Black women within the community that begins with early prenatal care. It will be essential to continue to analyze outcomes as the clinic continues to grow using an evidence-based approach to most effectively serve the women here in Kansas City, Missouri and improve maternal and infant health outcomes.

## **Zainab Habib**

Faculty Mentor: Dr. Joey Lightner

Academic Unit/Department: School of Nursing & Health Studies

Funding Source: EUREKA Course

### **Using Qualitative Research to Evaluate the Likes and Dislikes of a Mhealth Physical Activity Program: Active KC Program**

**Background:** Physical activity assistance is more critical than ever for marginalized populations, as the epidemic has resulted in fewer safe opportunities and less support for physical activity. Physical inactivity is more prevalent in women, persons over the age of 65, Black, Hispanic, and American Indian/Alaska Native adults. Physical inactivity is known to cause long lasting consequences such as heart failure, diabetes and hypertension which is why there is a need for change. Advances in technology have opened up opportunities for communities to be supported by scalable mobile health interventions (mhealth). Active KC is a research study and physical activity program that aims to help the Kansas City community move more throughout the day. The program involves educational and motivational text message based communication with participants and monitoring of physical activity through a Garmin vívofit 4 activity tracker.

**Objective:** The purpose of this project is to learn through qualitative research about the features that community members want and don't want in an mhealth physical activity program and to measure how effective and acceptable the program will be.

**Methods:** The intervention included a Garmin wearable device and text message content to encourage physical activity. Evidence-based behavior modification approaches such as self-regulation (monitoring and feedback), goal setting, obstacle identification and problem resolution, and motivation were used to guide the material. Prior to enrollment into the study, a screening form was completed to guarantee the potential participants had access to the necessary technology to engage in the intervention and participants received baseline survey and post intervention survey. The study team conducted focus groups with 33 participants and completed an inductive thematic analysis on all focus group content to identify lessons learned.

**Results:** Eight major themes were identified from the focus group interviews. These themes included: the Garmin watch has positive characteristics and functionality; the Garmin watch has problematic characteristics and functionality; text messages and/or website links/content are beneficial; text message and/or website links/content have challenges; program would be improved with additions/modification; program leads to beneficial outcomes program provides helpful behavior change strategies; program supports beneficial family/friend engagement/support.

**Conclusion:** Active KC qualitative data analysis approach provided evidence that the intervention was feasible to implement, agreed upon and effective for enhancing the increase of physical activity among adults and youth in the Kansas City Troost area. The Garmin watch paired with encouraging messages created the impact it intended to which was to increase physical activity by supporting self-monitoring and reinforcement.

## Paige Riggs

Faculty Mentor: Dr. Joseph Lightner

Academic Unit/Department: School of Nursing and Health Studies

Funding: EUREKA Course

### **Evaluating the Factors that Influence Missed Appointments at a Community Health Center**

*Background.* Patient missed appointment rate at federally qualified health centers has had a significant influence on staff workflow and patients. Missed appointments causes resources and time to be wasted and health issues to remain untreated. Most reasons for missed appointments commonly include lack of transportation, forgetfulness, demographic factors, financial barriers, and other obligations. *Objective.* The patient no show rate at Health Care Collaborative (HCC) Network has caused a disturbance to workflow for clinical staff. This evaluation was completed to determine what factors influence the missed appointment rate and how the missed appointment rate influences clinical staff. After determining common barriers that patients may face, possible intervention strategies were developed. The purpose of this evaluation is to provide recommendations to the HCC Network to reduce the patient no-show and missed appointment rate in the future. Recommendations were based on perspectives from both patient and staff surveys. *Design.* Patients who attended an HCC Network Clinic between March 1<sup>st</sup> 2022 to March 17<sup>th</sup> 2022 were asked to participate in a in-person survey. Patients that missed scheduled appointments between March 1<sup>st</sup> 2022 and March 17<sup>th</sup> were called and asked to complete the same survey via phone. A total of 68 patients were asked to complete the survey and 43 patients agreed to participate. A staff survey was also sent out to 59 clinical staff members to obtain their perspectives on the no-show and missed appointment rate. 31 staff completed the survey. We conducted a multivariate analysis to determine what factors influenced a missed appointment. *Results.* The following are predictors of missed appointments: age ( $t=2.63, p=0.01$ ), employment status ( $t = 2.6, p=0.01$ ), receiving healthcare reminders ( $t= 2.87, p=0.01$ ), long wait times ( $t=-2.88, p=0.01$ ) and whether the patient drives their own car ( $t=2.97, p=0.04$ ). Barriers that were reported from patients included transportation, location, cost/insurance, employment status and forgetfulness. *Conclusion.* Interventions to reduce the missed appointment rate at the HCC Network should focus on including strategies to help reduce barriers that were most reported. Possible intervention strategies include an interactive patient reminder call, confirming with patients that they have transportation to and from their appointment, and reducing long wait times with a patient portal option.

## Nancy Ziegler

Faculty Mentor: Dr. Joseph Lightner

Academic Unit/Department: School of Nursing and Health Studies

Funding Source: EUREKA Course

### **Community Health Improvement Plans and Physical Activity Implementation Strategies: Findings From a Cross-Sectional Survey of US Local Health Departments**

**Background:** Americans do not engage in enough physical activity (PA) to achieve health benefits. High rates of physical inactivity are related to compounding health issues, such as obesity, diabetes, and heart disease, that kill the majority of Americans annually. Evidence-based strategies, changes in infrastructure, and new policies all have the potential to increase physical activity levels. Community Health Improvement Plans (CHIPs) are tools that local health departments (LHDs) can use to strategically change PA levels within their communities. However, implementation strategies to implement physical activity strategies are understudied, making it challenging for public health practitioners to use them to their full potential. The aim of this study was to describe the PA implementation strategies that LHDs use within their CHIPs. **Methods:** An online survey was developed and distributed to 67 randomly chosen, accredited LHDs within the United States. Tribal and state health departments were excluded from the sample. Questions asked about respondent's CHIP's physical activity goals and objectives, barriers to increasing physical activity, types of chosen implementation strategies and for respondents to answer three categories (implementation outcomes, service outcomes and client outcomes) using their perceived beliefs. Respondents could respond in textbox, ranking, multi-select and Likert format. The responses were analyzed using both a qualitative theming analysis and descriptive statistics. **Results:** A majority of respondents reported that their CHIPs addressed PA (75%), with most of them stating that this was not their first-time addressing PA (80%). Respondents reported that the PA implementation strategies used within their CHIPs were safe (mean=4.57, SD=0.75), but belief that strategies would increase in PA levels was low (mean=3.39, SD=1.12). Qualitatively, out of five themed categories of PA objectives, respondents most commonly reported PA objectives within the built environment/infrastructure theme (mean=5.16, SD=3.23). However, this was not reflected quantitatively when respondents were asked to select as many changes to infrastructure strategies as needed, that reflected their CHIP's physical activity objectives. Out of nine strategy categories, changes to infrastructure were the least selected (39.3%, 1 $\geq$  strategy selected). **Conclusions:** PA is a commonly reported priority area among LHD's CHIPs, with a majority implementing well-studied, evidence-based strategies. However, there are inconsistencies between what health outcomes are described in CHIPs and the chosen implementation strategies to achieve them. This indicates a need to make implementation strategy terminology and components more consistent and to encourage a comprehensive collection of implementation strategies that is accessible to LHDs. This also calls for more research into the design and administration of CHIPs to encourage an increase in PA by selecting appropriate strategies, and to increase LHD's understanding of implementation strategies, as these are the bridges between health issues and desired health outcomes.

## 22<sup>ND</sup> ANNUAL SYMPOSIUM OF UNDERGRADUATE RESEARCH & CREATIVE SCHOLARSHIP

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Sasha Dellenbaugh—Poster 23  
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Mercedes Madison—Poster 46	Ereth Muwanika—Online Presentation
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Ben Mings—Online Presentation	Kennady Price—Online Presentation
Thomas Mitchem—Online Presentation	Canaan Punzo—Online Presentation
Sasha Mitton—Online Presentation	Anthony Ragonti—Online Presentation
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Hugo Mongalvy—Online Presentation	Austin Rexroad—Online Presentation
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