36th Annual Graduate Research Symposium
Post-Pandemic?: Reflect, Reimagine, Reemerge, and Research
Kent Student Center
April 7-8, 2022

Symposium Program
Schedule of Events

Thursday April 7, 2022

09:00—10:00 am  Welcome and Registration

10:00–11:30 am  Poster Presentation Session I  PS1—PS7

12:00–01:30 pm  Keynote Address and Lunch

2:00–03:30 pm  Poster Presentation Session II  PS8—PS14

Friday, April 8, 2022

08:00—09:00 am  Welcome and Registration

09:00 am–10:30 am  Oral Presentation Session I  OS1—OS7

11:00 am–12:30 pm  Oral Presentation Session II  OS8—OS13

01:00–02:30 pm  Awards Luncheon
Thursday, April 7, 2022
09:00—10:00 am: Welcome and Registration
Second Floor, Kent Student Center

Symposium Headquarters: Second Floor, The Governance Chamber

10:00–11:30 am: Poster Presentation

**Session I**

**PS1: Biological Sciences**
Second Floor, Windows

1. Katherine Manning & Christie Bahlai, *Characterizing insect communities within thin-soil environments*
2. Lia Gavazzi, Manas Nair, Lisa Cooper, & J.G.M. Thewissen, *The Whale’s Tale: Protein signaling in the tail flukes of the embryonic beluga whale*
3. Hannah Hartman, *Where do they come from? Using microsatellite and ddRADseq markers to infer the encroachment dynamics of Juniperus virginiana in the Lakeside Daisy Nature Preserves*
4. Harlee Rush, Mark Kershner, & Oscar Rocha, *Bugs and booze: An analysis of urbanization and vegetation effects on flying invertebrate communities*

**PS2: Ecology and Evolutionary Biology**
Second Floor, Windows

5. Don Ingold, *Pollinator Communities along a precipitation gradient in the Seasonally Dry Tropical Forest of Costa Rica: is there a mismatch between flowering time and pollinators activity?*
6. William Haas, *Genetic variation and differentiation among Coastal Red Cedar (Juniperus virginiana silicicola) populations across its geographical range*
7. Matthew Wuensch & David Ward, *Forage preference by white-tailed deer in relation to nutritional benefits and costs*
8. Christian Bullion & Christie Bahlai, *Factors contributing to the reliability of data in Odonata citizen science*

**PS3: Biomedical Sciences**
Second Floor, Windows

10. Tej Nakashe, Zachery Knauss, Andrew C. Beard, Stephen J. Lewis, & Derek S. Damron, *D-Cysteine ethyl ester reverses fentanyl-mediated inhibition of “intrinsic Ca2+ activity” in neurons isolated from superior cervical ganglion*

12. Lana Frankle, Hannah Lee, Kole Jarzembak, Olesia Benedict, & Robert Clements, *Changes to astrocyte activation markers at different stages of cuprizone treatment*

13. Kirsten Maricic, Carlye Neaffer, Hailey Harbert, Grant Cromeens, & John Johnson, *Corticosterone Regulation of Locus Coeruleus Activity*

**PS4: Chemistry & Biochemistry I**
Second Floor, Windows


15. Shankar Pandey & Shankar Mandal, *Chirality Transmission in Macromolecular Domains*

16. Payel Datta, *Optimization of potency of Pt (IV) prodrugs via a small library of Pt (IV) derivatives*

17. Amarasooriya Jayawardhana, *Cytochrome c accelerating activation of mitochondria-damaging Platinum(IV) prodrugs*

**PS5: Chemistry & Biochemistry II**
Second Floor, Windows

18. Thulasi Mahendran, *Selective mRNA oxidation of the mitochondrial electron transport chain complex subunits in human neuronal cells dysregulate energy production in Parkinson’s disease*

19. Man Kshetri, Payal Datta, Wjdan Jogadi, Suha Alqarni, May Cheline, & Yaorong Zheng, *Fatty Acid-Like Pt(IV) Prodrugs with Controllable Cytotoxicity Profiles*

20. Brad Popovich, *CMDR: An In Vitro Model for Studying Aspects of Myelination linked to Multiple Sclerosis*

**PS6: Health Sciences, Nursing, and Public Health**
Second Floor, Windows

21. Kaitlin Hards, *The Effects of Parents' Use of Milieu Strategies on Toddlers' Functional Communication*

22. Emily Tagesen, Ryan W Grant, Jennifer Rivera, & Adam R Jajtner, *Reliability of a velocity measuring device during four intensities of the barbell back squat*

23. Tsz Chun Lam, *Developing risk-adjusted models for emergency preparedness and response funding of local health departments in Ohio*

24. Rachel Ogilby, *RESTORE: Improving Resilience and Reducing Burnout in Critical Care Nursing Staff (Virtual)*

25. Angela Gager, *Mindfulness as a Wellness Intervention to Address Burnout Among Critical Care Nurses*

**PS7: Language and Learning**
Second Floor, Windows

26. Molly Schenker, *Reading and Speech Perception*
27. Anna Faust, *The Effects of Milieu Teaching to Increase a Child's Expressive Language in a Home Setting*
28. Rosann Gage & Lanson Wells, *A paleography workshop for middle school*
29. Maryam Zolfaghari, *Second-grade students' demonstrated fragmenting with visual static models*

12:00–01:30 pm: Keynote Address and Lunch
Ballroom

Keynote Speaker: Professor Tara C. Smith

Dr. Smith is a Professor of Epidemiology at the Kent State University College of Public Health, which she joined in August 2013. She completed post-doctoral training in molecular epidemiology at the University of Michigan. She obtained her PhD at the University of Toledo, investigating the pathogenesis of the Group A Streptococcus, and her B.S. in Biology from Yale University.

**Keynote: Lessons Learned from the COVID-19 Pandemic**

2020 saw the beginning of the first major new respiratory virus pandemic in a century. Despite being ostensibly one of the most-prepared countries to handle such an event, the United States has floundered in its response, and has one of the highest per capita death rates from COVID-19 among wealthy nations. This talk will discuss missteps in the response and what has been learned (or, not) for future pandemic events.

02:00–03:30 pm: Poster Presentation
Session II

PS8: Lifespan Development & Educational Sciences
Second Floor, Windows

30. Jessica Hunt, *Examining caregivers' implementation of naturalistic communication strategies to promote their child's functional expressive language.*
31. Samantha Eisner, *The effects of coaching caregivers to use naturalistic communication strategies on their child's functional communication*
32. Stephanie Oprandi, *The effects of parental use of naturalistic communication strategies for language acquisition in children with language delays*
33. Laura Dunson, *Media, mental health and stigma in college students*

PS9: Psychological Sciences I
Second Floor, Windows
34. Karlee Patrick, John Gunstad, Natalie Kayani, Jennifer Drost, & Mary Beth Spitznagel, *Relationships among Factors of Burden and Positive Aspects of Caregiving in Dementia Caregivers*

35. Erin Burke & John Gunstad, *Cognitive function 10 years after adolescent bariatric surgery*

36. Urja Bhatia & John Gunstad, *Impact of Lactobacillus rhamnosus GG on the gut microbiome and cognitive function in healthy middle-aged and older adults*

37. Elizabeth Cousins, *The Indirect Effect of Positive Aspects of Caregiving on the Relationship between Dementia Severity and Caregiver Burden*

38. Daniel Cole, Karigan Capps, & John Updegraff, *Who is wearing a mask? Testing the associations between demographics with face mask behavior, intentions, and perceptions*

**PS10: Psychological Sciences II**
**Second Floor, Windows**


41. Theresa Jacobs & William Merriman, *The effect of memory tasks on young children's word knowledge judgment*

42. Jasmin Beaver, Brady Weber, Sarah Kassis, Matt Ford, Anna Anello, & Lee Gilman, *Fear Processing in Mice with PMAT Deficiency*

43. Leslie Wood, *Trying not to die: Apathy and fragmented responses to race/ethnicity, gender, and social class disparities in the overdose crisis*

**PS11: Teaching, Learning, & Curriculum**
**Second Floor, Windows**

44. Grace Morris, *Connecting in a blended learning environment: Assessing the development of social capital in and outside of the higher education classroom*

45. Abbey Galeza & Timothy Rasinski, *Singing in Preschool Promotes Literacy Development*

46. Sara Fuller, *More than a Sunny disposition: Revising the Dispositions for Culturally Responsive Pedagogy Scale for Higher Education Online Faculty*

47. Christine Austin, *Student Perception of Automatic Feedback Type in Tertiary Pre-Calculus*

**PS12: Aesthetics and Arts**
**Second Floor, Windows**
48. Alexandria Dorband & Jihyun Kim-Vick, *Functionally fashionable: Merging orthopedic footwear with users' expressive and aesthetic needs*

49. Gabriela Gonzales Allende & Rui Liu, *Computational Form-Finding of a Biotensegrity Hybrid Textile Structure*

50. Kathalina Thorpe, *Letters in History: Props for the Stage*

51. Yee Lin Elaine Yuen & Catherine Amoroso Leslie, *An interactive technology approach to enrich the student-visitor museum experience*

52. Mary Rodack & James Tyner, *Nature, gender and class: Examining Tanzania's national identity through music videos*

**PS13: Communication and Collaboration**  
**Second Floor, Windows**

53. Brittany Viton, Monica Bartholomew, Randa Nemar, Heather Rundo, Abbey Galeza & Emma Royan, *Oral Reading Fluency of College Graduates: Toward a Deeper Understanding of College and Career Ready Fluency*

54. Gunel Alasgarova, *Azerbaijani immigrant parents' school involvement and their children's academic achievement*

55. Bethanie Mauerman, *The art of collaboration: The benefits of collaborating through research*

56. Kelsey Klatka, *Student outcomes related to teachers' use of mindfulness: A systematic literature review*

**PS14: Computer Sciences & Physics**  
**Second Floor, Windows**

57. Niranjan Rai & Xiang Lian, *Top-k Community Search in Large Road Network Graphs*

58. Neha Fnu, *Yolov5, You Only Look Once Object Detection State of the Art algorithm*

59. Sajad Shiekh, Golam Mustafa, Mohammed Enamul Hoque, Hamza Balci, & John J. Portman, *Emerging Accessibility Patterns in Long Telomeric Overhangs*

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**Friday, April 8, 2022**

08:00—09:00 am: Welcome and Registration  
Second Floor, Kent Student Center

**Symposium Headquarter: Third Floor, Room 309**

09:00—10:30 am: Oral Presentation  
Session I

**OS1: Architecture & Environment**  
Third Floor, Room 306-A
60. Leong Yin Tanya Chiu & Sara Bayramzadeh, *How to enhance children’s and parents’ experience through architectural elements: A survey study*
61. Hossein Mirzajani & Sara Bayramzadeh, *Perceived importance of wellness features to improve end-user experience in cancer centers: Patient and staff perspectives*
62. Hamid Estejab, *Free Standing Emergency Department: How to enhance wayfinding and user experience*
63. Alyssa Skilton & Reid Coffman, *Vegetative roof germination of Ohio native coastal species in reclaimed soils: A field study assessing Doellingeria umbellata and Sporobolus compositus*
64. Md Mazharul Islam, *Safety and Healing Environment in Child and Adolescent Behavioral Health Facilities*

**OS2: Biological Sciences**  
*Third Floor, Room 306-BC*

66. Sayoni Dutta, Xiaozhen Mou, & Laura G Leff, *The problem with drugs: Effects of widely used pharmaceuticals on the behavior and oxidative stress biomarkers of crayfish*
67. Amber Titus, Alyssa Reinagle, & Edgar Kooijman, *lipid droplet binding properties of perilipin 3 in model systems and adipocytes*

**OS3: Chemistry & Biochemistry**  
*Third Floor, Room 310*

70. Payel Datta, *Development of Pt-Ru conjugates toward elimination of drug resistant ovarian cancer*
71. Amarasooriya Jayawardhana & Srijana Bhandari, *Visible light-activatable Platinum(IV) prodrugs harnessing CD36 for ovarian cancer therapy*
72. Dinesh Marasinghe & Michael J. Tubergen, *Conformational Analysis of Valine Methyl Ester by Microwave Spectroscopy*
73. Michael Carrillo, Lindsey Speare, Dinesh Marasinghe, & Michael J. Tubergen, *Rotational Spectrum of 2-iodoethanol and its Large Iodine Nuclear Quadrupole Coupling Constants*
74. Mohammed Enamul Hoque, Hamza Balci, & Soumitra Basu, *CRISPR/dCas9-mediated in vitro transcription regulation in the vicinity of DNA G-quadruplex structures*
OS4: Individuals and Community
Third Floor, Room 313

75. Paul Geis, *Distraction in the contact zones: Benjamenian wandering as study abroad in the city*
76. Beth Nahlik, “To make this leap”: Understanding relationships that support community college students’ transfer journeys
77. Sebiha Balci, Bradley J. Morris, *The effect of gamification on intrinsic motivation and performance of online learners*
78. Yunhe Wu, *Father Hurry Up, Send Money Home:” Seeking Cantonese Manhood in the California Gold Rush, from 1849 to 1859*
79. Anne Garwig, *Sex Positivity in Fanny Fern’s Ruth Hall*

OS5: Effects of Environmental Change
Third Floor, Room 316

80. Anna Solberg, *Community perceptions of vegetation change in Queen Elizabeth National Park, Uganda*
81. Josie Myers, *Mapping Community Perceptions of Walkability in Small Town Minnesota*
82. Zia Ul Hassan & Anne Jefferson, *Assessment of Climate Change Impacts on Cleveland (Ohio) Urban Streamflow*
83. Daniel Wilcox & Michelle Bebber, *The Shift from Soapstone to Pottery in Eastern North America During the Late Archaic and Early Woodland Period: An Experimental Approach*

OS6: Liquid Crystal & Math
Third Floor, Room 317

84. Senay Ustunel Marianne Prévôt, Robert J. Clements, & Elda Hegmann, *3D Printed Fully Biocompatible Porous Liquid Crystal Elastomer Scaffolds as Cell Supports for Long-term Tissue Cultures*
85. Matthew Deutsch & Robin Selinger, *Twist and snap: Heterogeneous defect nucleation via Frank-Read sources in nematic liquid crystals*
86. Xinfang Zhang, *Structure and optical properties of twist-bend nematic liquid crystals doped with chiral dopants*
87. Runa Koizumi, Hao Wang, & Oleg D. Lavrentovich, *Liquid crystal elastomer coatings with patterned dynamic profile driven by visible light*
88. Lucas Onisk, Alessandro Buccini, & Lothar Reichel, *A preconditioned Arnoldi-Tikhonov method for the solution of linear discrete ill-posed problems*

11:00 am-12:30 pm: Oral Presentation
Session II
OS7: Liquid Crystal & Physics
Third Floor, Room 306-A

89. Mojtaba Rajabi, Hend Baza, Hao Wang, & Oleg Lavrentovich, *Active matter: Extracting useful work from chaotic motion of micro-swimmers using a nematic environment*

90. Golam Mustafa, *Impact of Molecular Crowding Conditions on Stability, Folding Landscape, and Accessibility of Long Telomeric Sequences*

91. Panambara Mudiyanselage Sineth Kodikara, Prabesh Gyawali, Hamza Balci, & Samuel Sprunt, *Liquid crystalline phase of GDNA*


OS8: Liquid Crystal
Third Floor, Room 306-BC


94. Hend Baza, Yuhan Wang, Mojtaba Rajabi, Hao Wang, & Oleg D Lavrentovich, *Command of active droplets by patterned topological defects and laser tweezers*

95. Zoltan Karaszi & Antal Jakli, *The devil is in the details Runa*

96. Chathuranga Prageeth Rajapaksha, Pushpa Raj Paudel, P. M. Sineth G. Kodikara, Björn Lüssem, Antal Jákli, Drona Dahal, Thiloka M. Dassanayake, & Vikash Kaphle, *Ionic liquid crystal elastomers-based flexible organic electrochemical transistors*

OS9: Economics and Politics
Third Floor, Room 310


98. Michael Palmieri, *Transformational Workplaces: The Economic and Political Benefits of Employee-owned companies*

99. Md Harun Or Rashid, *Pandemic, Neo-Slavery and the Garment Factory Workers in Bangladesh*

100. Adhik Badal, *Ethnic uprising in Nepal's Tarai: The making of Madhesi identity in the post-civil war transition*


OS10: Exploring Accuracy and Truth
Third Floor, Room 313
102. Charles Fitzsimmons & Clarissa A. Thompson, *Developmental differences in monitoring accuracy and cue use when estimating whole-number and fraction magnitudes*

103. Blair E. Braun, Maria S. Zaragoza, & Dustin Calvillo, *Social media and fake news: The role of repetition on the perceived accuracy of fake news*

104. Daniel Burrill, *Endorsing misinformation to maintain cultural consistency*

105. Jon Overton, *Building the pictures in our heads: The self-fulfilling prophecy of partisan conflict*

**OS11: Public Health & Wellness**  
*Third Floor, Room 316*

106. Chelsey Kirkland, *Using HANS KAI to improve community health worker wellness and self-care*

107. Eniolufolake Ayoade & Mary Step, *Alcohol, Tobacco, and Marijuana use and HIV outcomes among young people living with HIV*


109. MD Fourkan, *Does Medicaid Increase Emergency Room Use: Evidence from The Oregon Health Insurance Program?*


**OS12: COVID-19 Pandemic**  
*Third Floor, Room 317*

111. Peter Oyewole & Oluwakemi Falana, *Establishing a sense of community, creativity, and relationship among preschoolers and caregivers during and after the Covid-19 pandemic*

112. Mallory Wietrzykowski, *Should COVID-19 vaccines be mandated? Applying Annette Baier's definitions of 'trust' and 'reliance' to evaluate the ethics of vaccine mandates*

113. Chloe Miller, *Unmasking political identity: Beliefs and behaviors during the coronavirus pandemic*


01:00–02:30 pm: Awards Luncheon  
Ballroom
Sessions Abstracts

PS1: Biological Sciences

Katherine Manning & Christie Bahlai, Characterizing insect communities within thin-soil environments

Natural thin-soil ecosystems are areas in which bedrock has thin, or sometimes absent, soil on top of its surface. These are open environments with few primary producers that can survive, given the shallow growing medium, as well as high winds, lack of cover from solar radiation, and sometimes extreme precipitation conditions. These sensitive and unique habitats can be home to rare plant and invertebrate species. In the Great Lakes Region thin-soil ecosystems are typically in the form of alvars, rocky lakeshores, cliff edges, and barrens. This project characterizes the community composition of insect communities in thin-soil ecosystems in northern, central, and southern regions of the Southeastern Great Lakes region of North America. We predicted that individual insects would vary across the regions, but they would be functionally similar. In June – August of 2019 bowl traps, sticky cards, and ramp traps were used to capture insects for 48 hours once per month. We compared biodiversity metrics between regions, finding no difference in insect community. Bees collected during this same time period will be identified to the lowest taxonomic level possible to assess if this pattern holds true at a higher resolution within one target taxa.

Lia Gavazzi, Manas Nair, Lisa Cooper, & J.G.M. Thewissen, The Whale’s Tale: Protein signaling in the tail flukes of the embryonic beluga whale

Within mammals, cetaceans (whales, dolphins, and porpoises) are unique in their loss of hindlimbs. Instead, the soft-tissue flukes of cetaceans, found at the distal tail, are the main propulsive organ and have functionally replaced hindlimbs. Well-documented evidence suggest flukes first appear in the fossil record ~40 MYA and are associated with specialized tail vertebrae that are morphologically distinct from the rest of the caudal vertebral series. The emergence of the flukes is concurrent with reduction of the hindlimbs and disarticulation of the pelvis from the vertebral column, making the flukes a critical organ of study for evolutionary and developmental research. While cetacean embryology is well described, and prenatal flukes morphogenesis has been described at the gross anatomical level, the corresponding gene expression is minimally understood. It is our goal to understand the protein signaling related to the earliest phases of fluke development, which further provides insight into the signaling cascades necessary for the evolution of a novel appendage. We hypothesize that flukes develop using protein signaling similar the limb using the beluga whale as our model.

Hannah Hartman, Where do they come from? Using microsatellite and ddRADseq markers to infer the encroachment dynamics of Juniperus virginiana in the Lakeside Daisy Nature Preserves
Grasslands are considered one of the most imperiled ecosystems globally, partially due to woody encroachment. Lakeside Daisy Nature Preserve (LDNP) is a small grassland preserve on the coast of Lake Erie that is being encroached by the eastern red cedar (ERC). I am conducting this study to elucidate the pattern of range expansion of ERC into LDNP using genetic analysis. Range expansions may result from diffusion from the edge of the range or from long-distance dispersal events. A few founding ERC trees were present in the preserve in the 1990s and have grown in number, becoming the most abundant woody species in the preserve. I am investigating whether ERC's encroachment through LDNP resulted from seeds produced by the founder trees or seeds from neighboring populations arriving by long-distance dispersal. I utilize microsatellite markers to study the genetic diversity of the LDNP population since its establishment in the 1990s. My preliminary results show that genetic diversity increases in younger generations of ERC, indicating that more than one founding event occurred in this population. My findings also revealed a division in genetic distance among ERC trees in the population in two distinct groups, but it is unclear what is causing this grouping.

Harlee Rush, Mark Kershner, & Oscar Rocha, Bugs and booze: An analysis of urbanization and vegetation effects on flying invertebrate communities

Urbanization is defined as an area with high human population density and high land development when compared to its rural counterpart. As a result of urbanization, natural habitats are being destroyed and altered, causing fauna to migrate, decrease in abundance, or become extinct. Recent studies indicate that the increase in anthropogenic disturbance accompanying urbanization leads to an overall decrease in animal diversity. This decrease in diversity and abundance is seen well across insect communities. Insect communities are vital to ecosystem function as they occupy important niches such as pollinators, decomposers, predators, herbivores, etc. and act as bioindicators for their habitats. As bioindicators, the composition of an insect community can tell the story of the ecosystem in which they are inhabiting. This project aims to address the question: Do Forest insect communities change with their proximity to urbanized environments? To test our question, bait traps were deployed using Heineken™ beer to collect flying insect community samples across 10 Northeast Ohio parks. Within each park, 10 traps were deployed in ecotone and forested habitats. This study will shed light on the influence of anthropogenic influence in insect community composition in forested habitats.

PS2: Ecology and Evolutionary Biology

Don Ingold, Pollinator Communities along a precipitation gradient in the Seasonally Dry Tropical Forest of Costa Rica: is there a mismatch between flowering time and pollinators activity?
Seasonally dry tropical forests (SDTF) are the most threatened tropical ecosystems worldwide. SDTFs are the second-largest tropical forest type covering nearly 40% of all tropical forests. They have a significant concentration of endemic species and a high diversity of plant life forms and functional groups. SDTFs in Central America have two well-defined seasons: a rainy season with heavy rainfall from late May through November and a dry season consisting of a period of drought from January through early May. This alternation of wet and dry seasons dictates many facets of these ecosystems, including the phenology of plants and animals. In recent years, the timing of this cycle has been modified by climate change, producing dry seasons that begin earlier and last longer. These changes may cause disruptions of the ecological processes that determine plant-pollinator interactions due to changes in the flowering time of SDTF trees, and the activity of their pollinators falls out of synchrony. Using a small number of bee-pollinated SDTF trees in the Guanacaste National Park, Costa Rica, I plan to answer the following questions: Are pollinator communities visiting SDTF trees differing over a precipitation gradient? Are there differences in the production of fruits and seeds among populations of SDTF trees over a precipitation gradient?

William Haas, *Genetic variation and differentiation among Coastal Red Cedar (Juniperus virginiana silicicola) populations across its geographical range*

The Coastal Red Cedar (J. virginiana Var. silicicola) is found along the coast from North Carolina south to Florida and west to SE. Texas. Phenotypical, the Coastal Red Cedar (CRC) is similar to the Eastern Red Cedar, except for the smaller branches and cones. This study uses eight microsatellite markers to examine the genetic structure among seven CRC populations. My preliminary results using 96 CRC trees revealed 121 alleles in the eight loci that I examined. The number of alleles in each population ranged from 23 in P4 and P5 to 55 in P1. The average number of alleles per loci ranged from 2.9 in P4 to 6.9 in P1. Similarly, observed heterozygosity is high in all populations, but it was generally lower than the expected heterozygosity, indicating some level of inbreeding in all populations. Moreover, Wright's F-coefficients also supports some inbreeding among trees included in most populations (Fis=0.29). Wright's F-coefficients also show an intermediate level of differentiation among populations (Fst=0.12). I test if genetic differentiation among CRC populations can be explained by isolation by distance. Finally, I discuss the consequences of these findings for the possible encroaching behavior of this species in coastal and other novel habitats.

Matthew Wuensch & David Ward, *Forage preference by white-tailed deer in relation to nutritional benefits and costs*

White-tailed deer are one of the most ubiquitous large herbivores in North America, yet the factors that influence their foraging decisions remain relatively unclear. According to optimal foraging theory, deer should select tree species that possess the greatest nutritional constituents and avoid ingesting trees that possess large quantities of anti-nutritional compounds. We conducted a cafeteria-style preference study, in which we presented deer with a choice of eight tree species.
We identified preference by discerning the number of bites taken from each tree in a 24 h period and compared preferences to the nutritional and anti-nutritional composition of each tree species. Nutritional constituents that we analyzed were crude protein, tannin, total polyphenols, and volatile organic compounds (VOCs). We found that deer selected tree species that had the highest crude-protein content. However, American elm was a highly preferred species, despite having a low crude protein content consistent with species deer avoided. Deer foraged upon trees with a high tannin concentration at the same intensity as those trees that did not, however deer selected high-tannin trees less frequently. Preliminary data collection revealed that the avoided tree species had high concentrations of monoterpenes (a form of VOC), and highly preferred species emitted no monoterpenes.

Christian Bullion & Christie Bahlai, *Factors contributing to the reliability of data in Odonata citizen science*

In a changing world, it is essential to understand how species ranges and phenologies are altered to facilitate future conservation efforts. Unfortunately, for many species, the high-quality, long-term data necessary for these efforts may be unavailable. Odonates (dragonflies and damselflies) have established themselves as popular study organisms for climate studies, largely due to extensive links with their environment and their large hobbyist following. While records of this taxa may be limited to formal surveys, hobbyist participation in surveying offers unprecedented spatiotemporal coverage, making dynamic monitoring more feasible. However, while citizen science databases, like iNaturalist, house thousands of observations for this order, concerns regarding the accuracy and thoroughness of these public endeavors have arisen. In response, we integrated citizen science and direct field observations to evaluate the reliability of odonate citizen science surrounding the observed West Virginia data gap region and address the following question-- Are citizen science records reliable in capturing biodiversity trends? While our in-field sampling represented only a small window in time and space, current analysis of biodiversity metrics (richness, abundance, composition) implied that citizen science may be observing different communities than those reported by hobbyist experts.

**PS3: Biomedical Sciences**

Christina Watts, Jordan Smith, Emily Welch, Aalia Malik, & Colleen Novak, *The Role of Steroidogenic Factor-1 Neurons in Predator Odor-induced Muscle Thermogenesis*

Obesity is one of the most prevalent diseases quietly plaguing this nation. With predictions of its prevalence nearing almost 50% of the adult US population by the end of this decade, it is paramount to identify underlying mechanisms. Characterized by its imbalance of energy intake and energy expenditure, obesity can be countered by amplifying metabolic rate, including inducing thermogenesis. Primarily research has sought to understand adipose tissue thermogenesis, leaving little attention directed toward the brain mechanisms that regulate skeletal muscle thermogenesis. Published evidence from our research program has established
that exposure to predator odor (PO) evokes a robust thermogenic response in the skeletal muscle, suggesting that PO works through an unknown brain mechanism causing the thermogenic response. This metabolic response and the stimulation by predator threat each implicate the dorsomedial subregion of the ventromedial hypothalamus (dmVMH), and more specifically, the steroidogenic factor-1 (SF1) cells within it, as a region for further investigation. We hypothesize that SF1 neurons of dmVMH are a key node for predator odor-induced muscle thermogenesis. We use designer receptors exclusively activated by designer drugs (DREADD) delivered using a viral vector to SF1-Cre mice to assess this hypothesis. Utilizing DREADD technology, we stimulated the SF1 cells in the presence of a control odor or PO (ferret odor). Here, we analyze preliminary data looking at the muscle thermogenesis of SF1-Cre mice that have been bilaterally injected with mCherry control vector or an excitatory DREADD vector. Using clozapine-N-oxide (CNO) and manipulation of context (i.e., with or without the presence of PO), we have detected increases in thermogenesis with each PO exposure and CNO activation of SF1 neurons. However, these data provide little to no evidence of DREADD-induced amplification of the PO-induced thermogenesis. Our preliminary data supports the importance of SF1 neurons and their role in regulating PO-induced skeletal muscle thermogenesis.

Tej Nakashe, Zackery Knauss, Andrew C. Beard, Stephen J. Lewis, & Derek S. Damron, *D-Cysteine ethyl ester reverses fentanyl-mediated inhibition of "intrinsic Ca2+ activity" in neurons isolated from superior cervical ganglion*

With 69,006 deaths in 2020 alone, the opioid epidemic has escalated 38.4% over pre-COVID levels. Overdose results in opioid-induced respiratory depression (OIRD), which is currently treated by administration of naloxone or naltrexone. Due to the short half-life of the antagonists, they are not effective against highly potent, synthetic opioids such as fentanyl. Moreover, repeated use of these compounds often precipitates severe withdrawal symptoms. Our colleagues have found that D-cysteine ethyl ester (D-CYSee) reverses OIRD without affecting analgesia or precipitating withdrawal symptoms in rats. In this study, neurons from the superior cervical ganglion (SCG) were isolated from P0-P3 Sprague Dawley rat pups and cultured for 12 days. Cells were then loaded with a Ca2+-sensitive fluorescent probe and imaged in "real-time" to assess intracellular Ca2+ (iCa2+) activity under control, Ca2+ free, fentanyl alone or fentanyl + D-CYSee conditions followed by washout. Under control conditions, SCG cells displayed "intrinsic Ca2+ activity". The activity depended upon the presence of extracellular Ca2+. Fentanyl (10, 50 or 100 nM) produced a dose-dependent inhibition of Ca2+ activity that was completely reversed following administration of D-CYSee (100uM). Washout of the drugs resulted in a return to baseline Ca2+ activity. The ability of D-CYSee to effectively reverse the negative effects of fentanyl on intrinsic neuronal signaling in the SCG may be a key mechanism by which D-CYSee overcomes OIRD.

Preventing drug-associated retrieval would reduce relapse rates in addicts. Although little is known of gap junction involvement in the prelimbic medial prefrontal cortex (PL-mPFC), an area necessary for retrieval of cocaine-associated memory (Otis et al., 2013), either neuronal or astrocytic gap junction inhibition (GJI) can alter neuronal activity and plasticity (Palacios-Prado et al., 2014; Pannasch et al., 2011). We investigated the role of GJI during retrieval of cocaine-associated memory using a conditioned place preference (CPP) model. Before the first retrieval test, rats received a bilateral microinfusion of vehicle or neuronal, astrocytic, or general GJI into the PL-mPFC followed by daily testing. General and astrocytic GJI disrupted retrieval of a CPP during the first test and following infusion-free tests. In contrast, neuronal GJI enhanced retrieval relative to controls. To assess the effectiveness of GJI on calcium dynamics, fluorescently labeled cells in both slice and primary cell cultures from the PL-mPFC were analyzed over time under each GJI condition. Our findings suggest that desynchronizing astrocytic communication disrupts synaptic maintenance and efficacy leading to long-term synaptic depotentiation that underlies persistent retrieval deficits. Thus, gap junction communication in PL-mPFC may play a critical role in the maintenance of drug-associated memories that provoke relapse.

Lana Frankle, Hannah Lee, Kole Jarzembak, Olesia Benedict, & Robert Clements, *Changes to astrocyte activation markers at different stages of cuprizone treatment*

Cuprizone is a copper chelator that demyelinates neurons and is therefore frequently used to model multiple sclerosis as well as other demyelinating and degenerative diseases. Our previous work examining astrocyte dynamics using glial fibrillary acidic protein, or GFAP staining, confirmed a pattern of activation including increased process number and branching after one, two, and four weeks of cuprizone treatment. The current phase of the project aims to determine whether similar patterns are observed at one or two weeks of cuprizone treatment as well as when such changes begin. Animals were fed 0.3% cuprizone chow ad libitum for one or two weeks, sacrificed, dissected, and their brains halved with one half stained using GFAP and DAPI and imaged using confocal microscopy with astrocytes in the corpus callosum assessed for activation, and one half processed through Western blot. We used Western blots to measure levels of C3 or complement component 3, and Emp1 or epithelial membrane protein 1, in the whole-cell lysate of homogenized samples taken from the corpus callosum and/or cortex of control and experimental animals. C3 levels are measured because C3 is known to be upregulated in astrocytes that have an A1 reactive phenotype, which we are interested in evaluating, as well as by other cell types such as mast cells and macrophages in times of stress. Emp1 levels are assessed because Emp1 is upregulated in another type of activation phenotype less detrimental than A1 - A2. The relative levels of A1 and A2 activation would therefore be relevant to the progression of the disease phenotype. To confirm that the presence assessed by Western blot was representative of astrocyte protein levels of C3 and Emp1,
immunofluorescence was done using these proteins on fixed tissue slides taken at one, two and four weeks of cuprizone treatment.

Kirsten Maricic, Carlye Neaffer, Hailey Harbert, Grant Cromeens, & John Johnson, *Corticosterone Regulation of Locus Coeruleus Activity*

Major depressive disorder is a global problem affecting 264 million people worldwide. The pathophysiology of depression is not clearly understood, but it is associated with reduced prefrontal cortex activity. Research from our laboratory showed blocking corticosterone production in rats increases norepinephrine levels in the prefrontal cortex. Consequentially, we hypothesized that high cortisol levels, as seen in depressed patients, may act to suppress locus coeruleus neural activity thereby reducing norepinephrine levels and prefrontal cortex activity. To test our hypothesis, we used immunohistochemistry techniques to examine the level of neural activity (cFos) in the locus coeruleus (defined by Tyrosine hydroxylase staining) and other areas of interest in male and female rats in four treatment groups: 1) non-stressed controls; 2) vehicle-injected + restraint stress; 3) Corticosterone-injected + restraint stress; 4) Corticosterone blocker-injected + restraint stress. With n=3/group analyzed thus far, stress exposure increased cFos expression in the locus coeruleus of male rats but not female rats. Corticosterone administration reduced the activation in male rats as hypothesized, while blockade of corticosterone had no effect. A second cohort of animals is being processed before making final statistical conclusions.

**PS4: Chemistry & Biochemistry I**


Tail-free discotic liquid crystals are of interest because of their relatively simple structure and can serve as model systems for understanding fundamental liquid crystal properties. Conventional discotic liquid crystals are almost invariably functionalized with multiple long aliphatic tails. In contrast, the molecule 1,2,3,4-tetrafluoro-6,7,10,11-tetramethoxytriphenylene is very unusual as it has a broad discotic phase despite the fact that it has only four minimal methoxy tails distributed equally in two rings and four fluorine atoms in the remaining ring. Here, the synthesis of the full set of all the analogous tetramethoxytriphenylene molecules with zero to four fluorine atoms in the remaining ring are synthesized and their mesogenic properties are examined as a function of the extent and position of fluorination. Six out of the ten target molecules were found to be mesogenic. All compounds with a mesophase have a fluorine atom at the 1-position. A minimum of two fluorine atoms in the fluorinated ring were required to produce a mesophase. For the synthesis of the triphenylenes photocyclodehydrofluorination or a modified Scholl process were implemented for the ring closure reaction.
Shankar Pandey & Shankar Mandal, *Chirality Transmission in Macromolecular Domains*

Chiral communications demand close contact with neighboring functional groups, including chiral inducers. In the contact interface, the interaction strength is determined by an ensemble set of intermolecular forces (IMF) between functional groups, which is effective on the length scale of Van der Waals radius. It is not known whether long-range chiral communication exists between macromolecular tertiary structures such as peptide coiled-coils beyond the IMF distance. Harnessing the high sensitivity of single-molecule force spectroscopy, we investigate the chiral interaction between covalently linked DNA duplexes and peptide coiled-coils by evaluating the binding of a diastereomeric pair of three DNA-peptide conjugates. We find that right-handed DNA triple helices well accommodate peptide triple coiled-coils of the same handedness, but not with the left-handed coiled-coil stereoisomers. This chiral communication is effective in a range (<4.5 nm) far beyond canonical IMF distance. Small-angle X-ray scattering and molecular dynamics simulation indicate that the interdomain linkers are tightly packed via hydrophobic interactions, which likely sustains the chirality transmission between DNA and peptide domains. Our findings establish that long-range chiral transmission occurs in tertiary macromolecular domains, explaining the presence of homochiral pairing of superhelices in proteins.

Payel Datta, *Optimization of potency of Pt (IV) prodrugs via a small library of Pt (IV) derivatives*

Cancer is a group of diseases commonly characterized by uncontrolled growth and spreading of abnormal cells. There are three major methods for cancer treatment: surgery, radiation therapy and chemotherapy. Chemotherapy having advantages to be applied at any stage of cancer and being able to target different parts at same time, increases the survival rate significantly. However, side effects limit its application in curing cancer especially when cancer incurrence occurs, patients commonly develop drug resistance. The challenge of cancer recurrence by drug resistance has curved the path for my project to develop chemotherapeutics which can overcome the drug resistance. Herein we have synthesized a small library of fatty acid like Pt(IV) prodrug derivatives. These prodrugs are designed to target mitochondria to eliminate resistant cancer cells. The modification of head groups using various functional group and varying the carbon chain length, a comparative study has been done based on cancerous cell damaging effectiveness.

Amarasooriya Jayawardhana, *Cytochrome c accelerating activation of mitochondria-damaging Platinum(IV) prodrugs*

We developed the first visible light activatable Pt (IV) pro-drug that uses CD36, a transmembrane protein for a higher drug uptake in cisplatin resistance ovarian cancer. CD36 dependent cell entry facilitates the higher accumulation of pro-drug into the cell and the photoactivation allows immediate release of the active drug towards elimination of ovarian cancer cells. In this study we modified lipophilic fatty acid-like Pt(IV) compound with a fluorescein moiety for a light controllable activation. This modification allows the compound to have lower dark toxicity and readily releases active Pt compound upon irradiation by 490 nm blue LED.
GFAAS (Graphite Furnace atomic absorption spectroscopy) experiments confirm the higher cellular uptake of the Pt(IV) compound in cisplatin resistant ovarian cancer in a CD36 dependent manner. Photoactivation was explained with computational studies and release of the active Pt compound was confirmed by the increase of fluorescence signal of free dye molecule that escaped after irradiation. Flow cytometry data reveal the nuclear damage caused by the compound after the light irradiation and cell death via apoptosis. As a summary, we have demonstrated a new chemical design of visible light-activatable Pt (IV) prodrugs that exploit the upregulated CD36 to facilitate cell entry in ovarian cancer.

**PS5: Chemistry & Biochemistry II**

Thulasi Mahendran, *Selective mRNA oxidation of the mitochondrial electron transport chain complex subunits in human neuronal cells dysregulate energy production in Parkinson's disease*

Mitochondria is the powerhouse of major energy production in cells. Any disruption of mitochondrial functions has deleterious effect on the cells, since it curtails energy supply essential for survival. Parkinson's disease (PD) is one of the neurodegenerative diseases associated with dysfunctional mitochondria. In addition to energy production, mitochondria serve as the primary source of reactive oxygen species (ROS) generation in many cells, when electrons pass through the ETC complexes. Complex I deficiency resulting in elevated ROS levels has been identified to play a critical role in initiation and progression of PD. Subunits of ETC complexes are encoded by both mitochondrial and nuclear genomes. Oxidative damage to the mRNA will most likely have negative effects on protein synthesis. In this study we focused on the effects of ROS on mRNAs coding for the subunits of ETC complexes and their consequence on protein expression, leading to mitochondrial dysfunction. Subjecting differentiated human neuroblastoma SH-SY5Y cells to 100 µM sodium nitroprusside (SNP) treatment resulted in four mRNAs from the mitochondrial genome that are selectively oxidized leading to nearly 30-40% reduction in their protein levels. We also determined that there is 50% loss in the mitochondrial membrane potential after 24 hrs of SNP treatment. Taken together we hypothesize that deficiency of the ETC complex subunits due to RNA oxidation can create a vicious cycle of ROS generation in the mitochondria leading to enhanced mitochondrial dysfunction and neurodegeneration in PD and potentially other neurological disorders.

Man Kshetri, Payal Datta, Wjdan Jogadi, Suha Alqarni, May Cheline, & Yaorong Zheng, *Fatty Acid-Like Pt(IV) Prodrugs with Controllable Cytotoxicity Profiles*

The FDA-approved Platinum (II) drugs (cisplatin, carboplatin, oxaliplatin) have been widely used in cancer treatments in the US and worldwide. However, drug efflux by membrane transporters, intracellular detoxification, off target nucleophile binding, and DNA damage repair have stymied the efficient cellular entry, drugs stability, and DNA adduct formation, which lead to development of drug resistance, and it has been a long-standing challenge for cancer therapy. In
this project, we developed a series of novel Pt(IV) complexes that are able to overcome this issue. Different with their Pt(II) counterparts, the octahedral Pt(IV) complexes are more kinetically inert and the additional two axial ligands can be employed to modify their physical, chemical, and biological properties. Upon entering cancer cells, these complexes can be reduced to Pt(II) species triggering cell death. Therefore, Pt(IV) complexes are widely used as prodrugs. In a recent study, we developed a novel type of Pt(IV) prodrugs by mimicking fatty acid structure so it could be used for a CD36 mediated cellular entry in a “Trojan Horse” manner. CD36 is a transmembrane protein that is overexpressed in various cancer types toward increasing fatty acid metabolism. Unlike fatty acid fueling cancer cell survival, fatty acid-like Pt(IV) prodrugs trigger mitochondrial damage and overcome drug resistance. In this work, we found that head groups of such novel compounds play an important role in interactions with serum proteins, cell entry, mitochondrial damage, and cytotoxicity profiles. Notably, we found that small hydrophilic head groups can significantly promote therapeutic effects of the Pt(IV) prodrugs against platinum-resistant cancer cells.

Brad Popovich, CMDR: An In Vitro Model for Studying Aspects of Myelination linked to Multiple Sclerosis

Multiple Sclerosis (MS) is a debilitating disease affecting 2.3 million people, in which the destruction of myelin, the insulating sheath for neuronal axons, leads to axonal damage and interruption of neuronal transmission. Current studies on various aspects of myelination require the use of animal models, which is time consuming, expensive, and requires the sacrifice of many animals. Furthermore, to mimic MS the oligodendrocytes get destroyed completely making reliance on the live animal to replace these cells an essential need. This research provides an in vitro model for testing myelination that can lead to development of new therapeutics. Oligodendrocytes are cultured and treated using the Control, Myelination, Demyelination, Remyelination (CMDR) model. Myelination is induced using PMA. Demyelination is induced by careful use of lysolecithin, and Remyelination was tested using functionalize gold nanoparticles carrying a metabolite (NAA) used as a precursor to myelin lipids and upregulates myelin proteins. Cells are tested after each step for myelin proteins, for their associated mRNAs, and for myelin lipids. The D and R steps are improvement to current art. Lysolecithin is carefully administered to damage, but not destroy, most cells, generating a condition better simulating actual MS, and potentially eliminating the need for animal models. Proteins and mRNAs are shown to respond as expected, with one exception in D and M stages. Myelin lipids are also shown to respond as expected, thus showing the feasibility of the model. The results shown herein demonstrate the effectiveness of the model.

PS6: Health Sciences, Nursing, and Public Health

Kaitlin Hards, The Effects of Parents’ Use of Milieu Strategies on Toddlers' Functional Communication
The field of early intervention provides services and supports to families with children who have developmental disabilities or delays. Early Intervention strives to create more meaningful parent-child interactions throughout a child's daily routine. This single-subject, AB design examined the effects of parent's use of Milieu Teaching strategies on their children's functional expressive language. Parents received coaching support during home visits to ensure fidelity of the Milieu strategies that were used during daily parent-child interactions. The Milieu strategies included positive feedback, environmental arrangement, and modeling. The results show an increase in expressive language and turn taking throughout the child's day. Results also show that meaningful parent child conversations with parents create increased opportunities for language development.

Emily Tagesen, Ryan W Grant, Jennifer Rivera, & Adam R Jajtner, *Reliability of a velocity measuring device during four intensities of the barbell back squat*

**PURPOSE:** To determine reliability of a linear position transducer (LT).

**METHODS:** Eight individuals (25±5yrs) reported to the laboratory twice. On visit one, participants provided informed consent and performed a back squat one-repetition maximum (1RM). They returned to perform two sets of three repetitions of explosive squats at 30, 50, 60, and 70%1RM. The LT was grounded and attached to the inside of the barbell sleeve. The LT measured position at a frequency at 100Hz. Data was filtered using 0.1s rolling averages with a filtered velocity of 0.15m•s⁻¹. Average (AV), peak velocity (PV), and displacement (D) were calculated from the best repetition (BR), or repetition with the highest AV, and the average of three repetitions (AR) for all intensities. Reliability was determined via two-tailed dependent samples t-test and Intraclass Correlations. RESULTS: All velocities at all intensities were strongly reliable. Moderate reliability was noted for BR D at 30, 50, and 60%1RM with a strong reliability at 70%1RM. No differences between AR or BR velocities were observed. CONCLUSION: Data indicate strong reliability of the LT based on observed velocity at varying intensities. Given the varied training history, practitioners should interpret displacement with caution, as reliability was reduced, especially at 60%1RM. Future research should compare LT reliability among different training statuses.

Tsz Chun Lam, *Developing risk-adjusted models for emergency preparedness and response funding of local health departments in Ohio*

In Ohio's vulnerable population, disabled, infants, youth transition out of foster care, victims of domestic violence, and veterans have a higher demand on emergency preparedness funding. The Public Health Emergency Preparedness (PHEP) program is a critical source providing funding for state, local, and territorial public health departments. This program was initiated by the Center for Disease Control and Prevention (CDC) and funded by the federal government in response to the September 11 attack and the subsequent anthrax attacks. Community Resilience, Incident Management, Information Management, Countermeasures and Mitigation, Surge Management, and Biosurveillance, the six target domains in the PHEP program, are set to ensure a better prepared public
health emergency response for the state and local public health systems. In Ohio, the Public Health Department receives and responds for the allocation of the PHEP funding has applied the same allocation model since it was initially issued in 2011. This model offers minimum PHEP funding (Up to $65,000 as updated in the fiscal year 2022-2023) to all the 88 counties in Ohio. There is a tendency in this model that counties with less population tend to receive much PHEP funding allocation per capita compared with counties with large populations. However, the county with a large population would contain a larger vulnerable population, who have a higher severity need to receive more PHEP funding per capita, as the six domains targeted in the aim of the funding. Thus, an imbalanced PHEP funding allocation and inefficient preparedness for public health emergencies may occur in this primitive model. Based on the uneven PHEP funding allocation on a county level, this research explores two county-level vulnerability indexes, Social Vulnerability Index (SVI) by CDC and Ohio Opportunity Index (OOI) by the Ohio Department of Health (ODH), in comparison with the primitive model respectively. SVI is a representable index that could reflect the potential negative effects on the vulnerable population in each Ohio county caused by external stresses on human health (CDC), while OOI aims to locate the needs for improving vulnerable Ohioans’ living conditions (CDC). The investigation on these two additional indexes could help develop an efficient and sufficient funding allocation model and contribute to each individual in Ohio with equally preparedness-weighted funding.

Rachel Ogilby, RESTORE: Improving Resilience and Reducing Burnout in Critical Care Nursing Staff (Virtual)

Current research suggests that critical care nursing staff have some of the highest rates of burnout. Literature shows that resiliency training is an evidence-based method to reduce burnout symptoms and may improve job satisfaction, decrease staff turnover, increase patient satisfaction, and improve patient outcomes. The purpose of this project was to determine if a four-hour resilience class focused on emotional intelligence, self-care, resiliency, and art therapy decreases burnout symptoms in critical care nursing staff. Participants were recruited from critical care units at one large hospital in Northeast Ohio. Inclusion criteria included English-speaking critical care staff. The Maslach Burnout Inventory was offered at the beginning of training and six weeks after. A demographic questionnaire was collected. The project utilized a quasi-experimental design with a pretest-post-test that included a control group. A paired t test was used to evaluate if participants' burnout symptoms decreased after resilience training. Depersonalization scores increased post intervention. Critical care nursing staff at this organization have worse burnout symptoms than those of the general population of workers in human services professions. Nursing staff who plan to leave the organization in the next five years showed high emotional exhaustion scores. Participants ages 25-34 showed significantly higher depersonalization scores when compared to those ages 45-54 and 55 and older. Participants ages 35-44 showed significantly lower mean personal accomplishment scores than those ages 55 and older. The hospital can use the results from this study to focus resiliency efforts on specific
age groups at risk for burnout, capitalize on the knowledge that staff is at risk of leaving the system due to burnout, and potentially mitigate turnover costs with burnout reduction strategies.

Angela Gager, *Mindfulness as a Wellness Intervention to Address Burnout Among Critical Care Nurses*

Burnout is a recognized issue impacting intensive care unit nurses. Wellness interventions, such as mindfulness workshops, have demonstrated efficacy in reducing burnout among nurses. The purpose of this project was to assess the impact of a mindfulness workshop on burnout among critical care nurses. The project was a pre-test post-test design. An online mindfulness workshop conducted by a certified yoga instructor, was offered to ICU nurses in a local hospital. Assessment of burnout was measured pre-intervention and six weeks post-intervention using the Maslach Burnout Inventory Human Services Survey for Medical Personnel (MBI-HSS-MP). Of the one hundred and twenty potential participants, six nurses completed the pre-intervention survey and only one nurse completed the intervention and pre-post surveys. The mean scores across all domains for participants who completed the pre-test indicated high levels of burnout. The one participant who completed the intervention reported no change in burnout following participation. Critical care nurses with high levels of burnout rejected self-care interventions. Low participation rates can be attributed to high workload demands and staffing issues associated with the COVID-19 pandemic. Trauma informed leadership, research, and policies and procedures are needed to support nurses in a crisis healthcare environment.

**PS7: Language and Learning**

Molly Schenker, *Reading and Speech Perception*

Speech perception is essential to learning and communication, yet the influence of neurodiversity on speech perception is not well understood. This poster will present data on the extent to which individuals with hyperlexia, dyslexia, and neurotypical reading profiles learn to perceive degraded (noise-vocoded) speech. Using methods adapted for virtual data collection, participants' phonological processing and reading skills are tested synchronously via Microsoft Teams. Perception of degraded speech signals is tested asynchronously via an online platform allowing participants to listen to noise-vocoded sentences and repeat the words they heard in each sentence. Participants' sentences are transcribed and analyzed for number of correct words reported. It is expected that neurodiversity will be associated with reading profiles, which will predict how well and how quickly individuals will learn to understand noise-vocoded speech.

Anna Faust, *The Effects of Milieu Teaching to Increase a Child’s Expressive Language in a Home Setting*
Early Intervention is important in identifying and providing effective early support to families and their children who have developmental delays or disabilities. Children learn language through back and forth interactions with the adults in their lives. Addressing language delays early on is important for future success in their lives. A single-subject research design with baseline and intervention was used. Synthesis of preexisting research on the effects of Milieu Teaching (IV) on expressive language skills (DV) of children with developmental delay guided intervention. A coaching interaction style is used to support parents to implement Milieu Teaching strategies that develop expressive language skills with their child. Home visits occur once per week at least 60 minutes per session in their home where video data was collected. The implication of these results indicate that intentional parent-child interactions can improve functional communication and have a positive impact in future learning in school.

Rosann Gage & Lanson Wells, *A paleography workshop for middle school*

The Medieval Academy of America identified a need to bridge academia and the local community and offered grants to that effect. This program was designed in response to that need and grant application. In collaboration with the Lake Local Middle School 7th grade social studies teachers, we plan to align with their curriculum and present an informative, hands-on workshop regarding medieval manuscripts and paleography to the total class population of 250 students. We seek to introduce students to methods paleographers use to identify manuscripts and to introduce students to methods of writing, writing materials, production, and collections. Kent State University is located less than 30 minutes from Lake Local and offers degrees in Library Science, English, and a minor in Ancient, Medieval, and Renaissance Studies. This program creates increased accessibility in the community for the middle school students to experience medieval manuscripts and promotes a sense of community building by bridging the gap between academia and the local community.

Maryam Zolfaghari, *Second-grade students' demonstrated fragmenting with visual static models*

Fractions are a fundamental concept for students that facilitates students’ understanding of mathematical concepts. Despite the importance of fractions, most students, and even adults, find fractions a difficult topic to learn. Even teaching fractions is considered challenging by elementary school teachers (Son, 2012; Vula et al., 2016). One of the methods that students can rely on to relieve such difficulty and conceptualize the problem is using visual or pictorial representations (Common Core State Standards, 2010). Using pictorial models supports students in understanding mathematical concepts and relationships (NCTM, 2000). This study examines second graders’ early fraction knowledge within three different visual static models, including circular and rectangular models. The result suggested a significant difference between children’s performance using the rectangle and circle models. Children who used the rectangle model were more consistent in doing fractions’ problems.
Jessica Hunt, *Examining caregivers' implementation of naturalistic communication strategies to promote their child's functional expressive language.*

In the field of Early Intervention, naturalistic communication strategies have shown to be effective in promoting children's functional expressive language and fostering positive caregiver-child interactions within the child's daily activities and routines. This study evaluated the effectiveness of naturalistic communication strategies on a 24-month-old child with an expressive language delay. The child's expressive language was measured based on vocalizations, words, and phrases and was targeted via single subject, AB design, with baseline and intervention in the home. Set types of daily activities and routines were observed through videotaped sessions. The intervention phase involved coaching the caregivers to implement the following strategies: following the child's lead, modeling, expansion, and positive feedback. The results of this study aligned with previous research in which caregivers implemented the strategies during their child's daily activities and routines which promoted the child's functional expressive language.

Samantha Eisner, *The effects of coaching caregivers to use naturalistic communication strategies on their child's functional communication*  

Early intervention (EI) focuses on working with families as a whole to enhance caregivers' interactions with their children to promote learning through daily routines. Many families seek EI based on concerns that their child is not talking. A key role for interventionists is to support the caregiver's knowledge or understanding of child communication and language development. Based upon this knowledge, professionals will be able to guide parents to the most effective strategies that enhance the child's development. A single-subject A-B design with baseline and intervention was used to examine the effects of coaching the caregiver on naturalistic communication strategies (IV) within their daily routines to affect the child's functional communication (DV). Study findings will be discussed to demonstrate a replication of prior evidence that caregivers can use strategies that promote their child's functional communication in their daily routines.

Stephanie Oprandi, *The effects of parental use of naturalistic communication strategies for language acquisition in children with language delays*  

Early intervention is a system that provides coordinated support and services to families that have young children with developmental delays. In recent years, families have sought early intervention more often due to concerns with communication delays. The role of the EI Professional is to support caregiver use of evidence-based practice through parent-child interaction in daily routines that improve language. This single-subject AB design examined the effects of parental use of naturalistic communication strategies (IV) on their child's expressive communication skills (DV). The professional coached the caregiver on intervention strategies during weekly home visits. Data was completed during
home visits using video and analyzed. The results will be shared, and it is predicted that it will align with prior research that parents can successfully interact with their child to improve their expressive language.

Laura Dunson, *Media, mental health and stigma in college students*
Movies and television shows explore themes of mental health, ranging from the tumultuous feelings experienced by Riley in *Inside Out* to the complex lived experiences of mental illness in *Silver Linings Playbook*. As some media depict the complexity, the reality, and the normalcy of mental health, other portrayals villainize mental illness through dangerous, unpredictable, and problematic characters defined by their mental health. Early research suggests that media portrayals may impact how the public understands and stigmatizes mental illness (Granello and Pauley, 2000), however little research explores how individuals experiencing mental health concerns experience these media portrayals themselves. This qualitative grounded theory analysis explores how college students seeking mental health services experience media portrayals of mental health in television and movies. Initial findings and emerging themes will be presented, as well as implications for mental health professionals, media creators, and future research.

**PS9: Psychological Sciences I**

Karlee Patrick, John Gunstad, Natalie Kayani, Jennifer Drost, & Mary Beth Spitznagel, *Relationships among Factors of Burden and Positive Aspects of Caregiving in Dementia Caregivers*
A negative correlation between positive aspects of caregiving and burden is well-established in dementia caregivers. It has been suggested that a positive appraisal of caregiving may be protective against burden, but less so in the context of certain elements of caregiver burden, for example, impact on life due to daily care needs. However, because past work has focused on positive aspects of caregiving overall, it is not clear if certain elements would be more closely associated with factors of caregiver burden, and thus serve as more specific targets for intervention. The current study sought to explore the complexity of the relationships among factors of caregiver burden and positive aspects of caregiving. A sample of 527 dementia caregivers was drawn from a registry of continuously enrolled patients of an outpatient geriatric clinic. Caregivers completed the Zarit Burden Interview (ZBI), a measure of caregiver burden, and the Positive Aspects of Caregiving (PAC) scale. Zero-order correlations replicated prior findings of a negative relationship between the PAC and ZBI. Exploratory Factor Analysis (EFA) of the PAC aligned with a two-factor structure: Self-Affirmation and Outlook on Life. EFA of the ZBI supported a four-factor structure: Impact on Life, Impact on Relationships, Guilt/Uncertainty, and Overwhelm. Controlling for demographic variables likely to influence caregiving, regression analyses indicated that PAC Outlook on Life significantly predicted ZBI Impact on Life, with higher Outlook on Life scores associated with lower Impact on Life scores. Both PAC Outlook on Life and PAC Self-Affirmation
predicted ZBI Impact on Relationships such that higher Outlook on Life and Self-Affirmation scores predicted lower Impact on Relationships. Neither PAC factor predicted ZBI Guilt/Uncertainty or Overwhelm factors. While past work has suggested that efforts to enhance positive appraisals of caregiving may not be of benefit when burden is linked to instrumental caregiving needs, the current study suggests that a more focused approach targeting caregivers’ Outlook on Life might be useful in this case. Future work should explore whether interventions specifically targeting the Outlook on Life factor of PAC differentially impact factors of caregiver burden.

Erin Burke & John Gunstad, *Cognitive function 10 years after adolescent bariatric surgery*

Adolescent bariatric surgery produces a long-term reduction in comorbidities like hypertension and type 2 diabetes, though no study has examined whether it also improves cognitive function. A total of 73 young adults (26.7 +/- 1.58 years, 76.7% female) completed the Webneuro computerized cognitive test battery 10 years after adolescent bariatric surgery. Deficits on tests of attention (e.g., Digit Span, 23.6%; Continuous Performance Test – Reaction Time 25.4%) and executive function (e.g., Maze Errors - Overrun 31.4%, Switching of Attention – Letter/Number, 27.4%) were more common than found in the normative population. Males [χ2 (1) = 5.192, p = .02] and persons with hypertension prior to surgery [χ2 (1) = 4.97, p = .03] were more likely to exhibit impaired cognitive functioning. If replicated in future work, these findings suggest that cognitive function improves following adolescent bariatric surgery, but may not fully normalize at 10 year follow-up – particularly on tasks mediated by frontal brain regions. Future studies are needed to determine whether these deficits persist to later follow-up (e.g., 20 years post-surgery) and clarify underlying mechanisms.

Urja Bhatia & John Gunstad, *Impact of Lactobacillus rhamnosus GG on the gut microbiome and cognitive function in healthy middle-aged and older adults*

The micro-organisms that colonize in the gut, often termed the gut microbiota, have been linked to neurological conditions and cognitive impairment in past work. Probiotic supplementation, which increases beneficial microbiota and reduces inflammation, has been suggested as a possible intervention to protect the aging brain. As part of a larger project, the current study examined the possible benefits of probiotic Lactobacillus rhamnosus GG (LGG) on microbiome composition and cognitive function in healthy middle-aged and older adults. A total of 200 individuals enrolled in a double-blind, randomized clinical trial. Highlighted in a previous paper, persons meeting criteria for mild cognitive impairment (MCI) within the sample showed improvement on testing after 90 days of probiotic supplementation. Interestingly, current analyses found no effect of LGG on global gut microbiome composition (e.g. alpha diversity). However, at the genus level, Prevotella and Lachnobacterium were significantly higher in persons with MCI. Examining treatment effects, probiotic supplementation decreased the abundance of Prevotella, trending toward significance. If replicated in other samples, the current findings raise the possibility that probiotic
supplementation may help to protect against further cognitive decline in persons with MCI and encourage mechanistic examination of Prevotella.

Elizabeth Cousins, *The Indirect Effect of Positive Aspects of Caregiving on the Relationship between Dementia Severity and Caregiver Burden*  
Caregiver burden tends to worsen as severity of dementia increases in the care recipient and can lead to negative consequences for dementia caregivers. In contrast, positive aspects of caregiving, such as experiencing feelings of being useful, needed, or appreciated in the context of caregiving, are associated with better outcomes. Caregivers reporting greater positive experiences robustly demonstrate lower levels of burden. Positive aspects of caregiving may thus be a key component of the relationship between burden and dementia severity. This study investigated relationships among caregiver burden, dementia severity, and positive aspects of caregiving, predicting that an indirect effect of positive aspects of caregiving would be observed on the association between dementia severity and burden. Data were extracted from the medical records of 724 patients enrolled for services at an outpatient memory clinic. Cross-sectional indirect effects analysis indicated a significant indirect effect of positive aspects of caregiving on the association between dementia severity and caregiver burden, accounting for 14.4% of the variance in the model. Results suggest that a caregiver who experiences positive aspects of caregiving may experience less caregiver burden as dementia severity worsens. Longitudinal examination of these relationships is needed to fully understand causality. Findings may help healthcare providers tailor treatment to alleviate caregiver burden.

Daniel Cole, Karigan Capps, & John Updegraff, *Who is wearing a mask? Testing the associations between demographics with face mask behavior, intentions, and perceptions*  
The COVID-19 pandemic continues to be a serious public health crisis around the world. Despite the guidance and regulations suggested by the Centers for Disease Control and Prevention, there seems to be a considerable amount of people who choose not to wear a face mask in public in the United States. Extant literature shows a variety of sociodemographic factors that are associated with mask wearing, however there are fewer studies that specifically investigate associations between demographics with face mask intentions and perceptions. The purpose of this study is to test associations between demographic variables (e.g., age, gender, political ideology) with face mask behavior, intentions, and perceptions. The multidimensional Face Mask Perceptions Scale will be utilized to suggest which elements of face mask wearing are the most prevalent (e.g., comfort, efficacy doubts, independence) when it comes to people not wearing masks. This study utilizes a dataset of approximately 850 undergraduate students enrolled at Kent State University. Participants completed an online survey comprising of self-report measures relating to face mask wearing behavior, intentions, perceptions, and more.

**PS10: Psychological Sciences II**
Jessica LaBuda & Judith Gere, *Perceptions of romantic partner stress: Accuracy, bias, individual differences, and outcomes*

Given the broad negative effects of stress on people's daily lives and relationships, knowing the degree to which romantic partners perceive each other's stress accurately and with biases can be critical to understanding how couples interpret, communicate, and cope with stress, and ultimately mitigate the adverse effects of stress to maintain a successful relationship. Using intake and daily diary data collected online from cohabiting couples across the United States, we examine the level of tracking accuracy, bias (projection and mean-level), and similarity in people's judgments of their romantic partner's daily stress. We also examine whether individual differences (i.e., stress communication; responsiveness; dyadic coping style) influence levels of accuracy and bias in partner stress perceptions. Additionally, we investigate if biased perceptions of partner stress, compared to accurate perceptions, are associated with conflict, relationship satisfaction, satisfaction with stress support, perceived positive dyadic coping, and perceived negative dyadic coping.

Karen Wetzel & Mary S. Himmelstein, *The impact of self-stigma and vigilance on the relationship between weight stigma and maladaptive eating behaviors: A moderated-mediation model*

Weight stigma (social devaluation because of weight) and self-stigma (personal devaluation because of weight) have been independently implicated in maladaptive eating, which ultimately contribute to poor cardiometabolic health. Additionally, vigilance coping (being on the lookout for social devaluation) is connected to stress, poor sleep, and depression. Most research considers these factors separately, but it is essential to establish how these variables interact with one another to understand their cumulative impact on health behaviors. Using a diverse national panel of adults in the US (N=1,005), this study tested several moderated mediations in which weight stigma was both directly associated with maladaptive eating and indirectly associated with maladaptive eating via vigilance coping. We simultaneously examined whether the relationship between weight stigma and vigilance coping was moderated by self-stigma (i.e., whether the link between stigma and vigilance was strongest among those who self-stigmatize relative to those who do not). Using the Process Macro, we tested moderated mediation and found support for it among several maladaptive eating outcomes: binge eating, eating to cope with stress, and restrictive dieting. These results provide support for a theoretical model which explains how weight stigma, self-stigma, and vigilance coping interact with one another to produce negative health behaviors.

Theresa Jacobs & William Merriman, *The effect of memory tasks on young children's word knowledge judgment*

The ability to judge one's knowledge improves during early childhood. Experiences that highlight the contrast between familiar and unfamiliar kinds may help children to make these judgments. Hartin et al. (2018) found that pre-
exposing preschoolers to a mix of familiar and unfamiliar objects caused them to make more accurate judgments of whether they knew names for various objects. We examined whether pre-exposure to a mix of familiar and unfamiliar words might cause children to make more accurate judgments of whether they knew the meanings of various words. Sixteen children were assigned to each of three conditions (M age = 4-2; range = 3-3 to 4-11). During a video-chat, E told the child to listen to two animals and remember the things that each said they liked. Conditions differed in what these things were: a mix of familiar and unfamiliar words (Familiarity Contrast); all familiar words (Familiars); or non-word stimuli such as actions and symbols (Control). Children then judged whether they knew the meanings of various words. As predicted, Control made these judgments less accurately than the other conditions. However, the other conditions did not differ. We discuss possible reasons why results for words differ from those for objects.

Jasmin Beaver, Brady Weber, Sarah Kassis, Matt Ford, Anna Anello, & Lee Gilman,

_Fear Processing in Mice with PMAT Deficiency_

The plasma membrane monoamine transporter (PMAT, Slc29a4) is a polyspecific cation transporter that, in the brain, predominantly takes up monoamine neurotransmitters. PMAT function is hypothesized to emerge when other monoamine transporter function is impaired. In humans, common genetic polymorphisms can reduce PMAT function. Nothing is currently known about how reduced PMAT function affects fear processing, nor any other aspects of emotional learning or memory. Our lab has begun examining the effects of PMAT deficiency on both cued and contextual fear processing by using mice with constitutive reductions in PMAT function (i.e., heterozygotes), and comparing these to wildtype mice. We hypothesized heterozygote mice would display lower levels of both cued and contextual fear relative to wildtypes. Surprisingly, we've only observed a trend (p=0.08) specifically in male heterozygotes for attenuated cued fear expression. Four weeks after fear processing behavior tests concluded, mice were subjected to a brief swim stress, and blood was collected for stress hormone quantification. These data are currently being analyzed, and we hypothesize that heterotypic stressor exposure will unmask the behavioral sequelae of reduced PMAT function. Continued investigation into how reduced PMAT function affects emotion processing and stress responsivity could have translational implications for people with functional PMAT polymorphisms.

Leslie Wood, _Trying not to die: Apathy and fragmented responses to race/ethnicity, gender, and social class disparities in the overdose crisis_

This dissertation project is a relational ethnography studying the interconnected aspects of drug use, harm reduction, treatment and recovery in a small Northeast Ohio city where the pandemic has drawn attention away from the overdose crisis and exhausted human capital. I focus on neighborhoods where hard to reach populations access treatment resources and/or utilize harm reduction tools for continuous drug use. I also challenge existing institutions regarding race/ethnicity, gender, and social class disparities in access to resources for treatment, harm
reduction, and support services (i.e. housing, food and medical care). Preliminary data indicate a general lack of concern and/or unwillingness to address the increasing racial disparities in overdose deaths on behalf of city and county administration. Early findings suggest that some advocates for people who use drugs show limited awareness and concern, but currently do not prioritize any action-oriented plan to address these disparities. I also find that where city and county institutions and systems of care fall drastically short of providing basic survival resources for impoverished people who use drugs and/or seek treatment, local individuals and non-profits advocate in a variety of ways and work with diligence and compassion in attempt to fill these gaps.

PS11: Teaching, Learning, & Curriculum

Grace Morris, Connecting in a blended learning environment: Assessing the development of social capital in and outside of the higher education classroom

To become successful in college and other environments, college students should aim to develop social resources, such as the forming of social networks (Putnam, 2000). This is also known as the building of social capital (Coleman, 1988). Past research has examined the ways that social capital is obtained in different classroom models, such as in online courses (Mays, 2016; Diep et al., 2017; Zheng et al., 2020). However, there is a need to understand how social capital is developed in blended learning environments, particularly in times when students are not meeting in the classroom. The blended learning environment merges elements of the online classroom and the traditional face-to-face classroom (Chiu, 2021). This means that students are likely going to be interacting at different times and in different spaces both in and outside of the course. Acknowledging how social capital is built in and outside of the blended learning environment will help instructors recognize the ways in which social capital expands outside their course and affects persistence (Tinto, 2016). This poster will present a summary of social capital and blended learning environments, gaps in the literature, and will explain future ideas for future work.

Abbey Galeza & Timothy Rasinski, Singing in Preschool Promotes Literacy Development

Concepts of print are foundational reading skills that are developed during the preschool years. Concepts of print include the ability to distinguish words from pictures, locate where to begin reading on a new page or line of text, read words from left to right with one-to-one correspondence and letter/sound recognition. It is essential for young readers to master these concepts in order to move on to more complex areas of reading. The first author of this study will present how the repeated singing-reading a shared text can be used to improve preschoolers' print concepts. The instructional procedures employed are detailed, and students' response to the practice are detailed. Major findings of our work with intentional singing-reading of a shared text include significant improvements in preschool students' basic print concepts as well word recognition. Finally, we comment on the joyfulness that song can bring into the early childhood classroom.
Sara Fuller, *More than a Sunny disposition: Revising the Dispositions for Culturally Responsive Pedagogy Scale for Higher Education Online Faculty*

This study investigated the psychometric properties of the Dispositions for Culturally Responsive Pedagogy Scale (DCRPS) to determine whether it is an appropriate scale for higher education professors who teach online (Whittaker and Valtierra, 2018). The DCRPS consists of three domains, and the researchers felt it can be used in teacher preparation programs. It was validated using K-12 teachers in face-to-face classrooms. The scale was used to assess their values, attitudes, and beliefs about tenets of culturally responsive pedagogy. The research question asked, “Is the DCRPS a valid and reliable measure of culturally responsive pedagogical dispositions of higher education professors in the humanities and social sciences?” Prior to adopting the DCRPS for use in further research of higher education instructors a full psychometric evaluation of the items’ content and characteristics is required. To determine differences between group responses, Rasch Analysis and PCA were conducted. The sample consisted of 59 full time faculty who teach at least one course online in the humanities and social sciences. Three sub-scales were identified. Social Justice and Teaching and Learning was the first scale. The second scale was Student Teacher Relationships. The final subscale was the teacher values and introspection scale. These three sub-scales differed from the subscales identified by Whittaker and Valtierra.

Christine Austin, *Student Perception of Automatic Feedback Type in Tertiary Pre-Calculus*

Online software systems for mathematics assignments provide automatic feedback to students ranging from knowledge of correct response to elaborated explanations. This study examines precalculus students' perceptions of elaborated feedback with or without connections to mathematical concepts and whether students' perceptions influence their performance on a post-test.

**PS12: Aesthetics and Arts**

Alexandria Dorband & Jihyun Kim-Vick, *Functionally fashionable: Merging orthopedic footwear with users' expressive and aesthetic needs*

The aim of this study is to develop a functional, yet aesthetically pleasing footwear line geared towards women with orthopedic needs. Functional footwear assists in treating various lower extremity conditions but often lacks the aesthetic appeal many consumers look for. Creating a line with orthopedic and stylish components will reduce the trade-offs consumers must make when evaluating this category of footwear. The orthopedic components in this line were based on the most common problems found among women. Necessary orthopedic components were gathered from literature review, professional opinions, and current products available through retail; these design elements were kept to the standard of existing orthopedics as to not impede on their functional purpose. When determining the aesthetic appeal, trend and market research was conducted to
assess upcoming styles including materials, prints or colors, silhouettes, and fastenings. As this collection is meant to expand orthopedic product options in the market, research of current and potential target markets was conducted to determine various demographics, psychographics, and market areas in which the field could expand. The creation of this product line will provide a framework for company production and mass retail with the hope of future implementation.

Gabriela Gonzales Allende & Rui Liu, *Computational Form-Finding of a Biotensegrity Hybrid Textile Structure*

The hybridization of structural systems has made it possible to explore, develop and build increasingly complex forms through efficient and lightweight structures. The BeTa pavilion was an assembly created with the integration of the biotensegrity principles with bending-active and form-active components. It was designed employing self-supporting tetrahedral modules of flexible glass fiber reinforced plastic rods (GRFP) and connected through their vertices with a CNC knitted membrane. Its concept design was previously studied through physical prototyping and digital modeling. Thus, the stability of the individual and paired modules was achieved; however, its linear design process was unable to predict and control the global topology and determine the size, spacing, mechanical specifications of the modules for its fabrication. Under these challenges, this study presents the development of an efficient workflow of the iterative design process between conceptual design and the computational form-finding, with actual mechanical characteristics of materials considered, for a hybrid system that couples biotensegrity logics with bending and form-active components. The computational form-finding was fully developed in the Kiwi!3d, a platform to perform the Isogeometric analysis (IGA) that allows using the Non-uniform Rational B-Splines (NURBS) generated in CAD to perform the finite element analysis (FEA), avoiding the translation of the geometries to meshes and connectivity breaks in the processing. The exploration was developed in three stages: the global geometry, the base module, and then assembly.

Kathalina Thorpe, *Letters in History: Props for the Stage*

My poster “Letters in History: Props for the Stage” maps out the process properties designers take when creating ephemera (paper goods props) for the stage. This poster will follow the actual process, both through written and photographic examples of my recreation of one of Napoleon Bonaparte’s love letters to Josephine. Though this piece is not one crafted for a particular play the process and the documentation there of demonstrates the importance of this research. It breaks down how these delicate props are created and treated for the stage and how a properties designer applies research of historical documents and cultural backgrounds to recreate authentic and convincing replicas for the theater.

Yee Lin Elaine Yuen & Catherine Amoroso Leslie, *Cultural-based digital archive approach enrich student users’ curriculum interpretation and worldview*

Digitalization is essential for preservation and conservation purposes in the 21st century. Different fashion brands, magazines and museums have started to archive
their collections and documents digitally for years. Institutions, such as the Metropolitan Museum of Art in New York, have archived and digitized their collections' accessibility, including fashion-related artifacts online (Pecorari, 2019). These historical artifacts shown to their users are not only aesthetic objects but also contain cultural significance (Geladaki & Papadimitriou, 2014). In order to preserve and well use the artifacts from museums, providing extension value and information of the cultural resources to enrich users' cultural knowledge is critical. This study explores the potential of HistoryPin, a free online application for cultural storytelling, to expand student users’ worldview concept and interaction with the museum artifacts through a series of curated collections as a learning and engagement tool. A collaboration between Kent State University Museum and the School of Fashion’s Historic Textiles course in Spring 2022, this case study identified cultural artifacts including textiles, costumes, and related accessories to illustrate and support course topics. Artifacts representing a range of geographic areas were selected, digitized, and presented with images in different views, cultural and historical information, and linked data in the virtual tour setting of HistoryPin. Students from both online and in-person sections experienced a virtual exhibition of artifacts, which reinforced and extended class content for further interpretation and engagement. Advanced interactive technologies, such as comments, favorites, and thought/image sharing on different social media, from HistoryPin allowed students to reflect on cultural objects’ perspectives. After each section of the course, researchers gathered interactive comments of student users posted on HistoryPin. A content analysis approach of emergent themes revealed the impact and contributions of museum artifacts. Moreover, a targeted survey provided sub-analyses on the cultural-based digital archive approach which informed an overall assessment of the impact in enriching student users’ virtual museum experience. A close relation between museum field trips and curriculum could deepen students’ interpretation of classroom content (Fenn & Leslie, 2015). With the influential performance of HistoryPin, cultural textile knowledge purposefully archived could broaden students' worldviews through the global map and enrich their cultural understanding from additional references as storytelling on each museum artifact.

Mary Rodack & James Tyner, *Nature, gender and class: Examining Tanzania's national identity through music videos*

Tanzania's culture is an amalgamation of African, European, Indian and Middle Eastern influences. Its unique history combines these contrasting cultures with colonial and postcolonial policies and governments creating a complex identity. Musicians and artists are on the forefront of constructing and deconstructing the national identity. Video-sharing platforms such as YouTube allow artists to showcase their representation of Tanzania to their peers and the world. Many music videos include themes of nature, gender, and class which suggests Tanzanian artists believe these to be key themes in their national identity. The goal of this research is to contribute to the conceptual understanding of national identity through music by using a case study of Tanzanian music videos.
PS13: Communication and Collaboration

Brittany Viton, Monica Bartholomew, Randa Nemar, Heather Rundo, Abbey Galeza & Emma Royan, Oral Reading Fluency of College Graduates: Toward a Deeper Understanding of College and Career Ready Fluency

Fluency is an essential component to achieving reading success. Although fluency is widely accepted as being related to success in reading, Oral Reading Fluency Norms are not considered in curriculum beyond the eighth grade. In this study, Oral Reading Fluency Norms are established for college graduates. We assessed 113 adults on their reading fluency through gathering samples of each participant's oral reading. The results of this study determined that Oral Fluency Norms for college graduates are approximately 150 words read correctly per minute. Implications of this study suggest that high school teachers may aim for their students to read at 150 words correct per minute to achieve reading success and be ready for college.

Gunal Alasgarova, Azerbaijani immigrant parents' school involvement and their children's academic achievement

This study explores the Azerbaijani immigrant parents' school involvement in the USA schools and their children's academic achievement. This article studies factors that influence Azerbaijani immigrant parents' school engagement, such as parental expectation, parental satisfaction, and parental concerns. In-depth interviews were conducted with seven Azerbaijani parents from different states. The findings indicated that the Azerbaijani parents are educated, financially sufficient, and highly motivated. They could willingly compare their children's school life in Azerbaijan and the USA and sincerely describe both countries' positive and negative features. From the interviews, I could acknowledge that Azerbaijani parents are active in home-based activities rather than school activities. Parents augment reading, help in science and math, attend parent-teacher meetings, curriculum nights, keep active online communication with teachers but are not PTO members or volunteers at school. That is mainly because of cultural differences, language barriers, and workload. Also, Azerbaijani immigrants admits their children succeed at school primarily because of their constant engagement, at the same time due to school support, counseling services, and a more accessible curriculum compared to Azerbaijani schools.

Bethanie Mauerman, The art of collaboration: The benefits of collaborating through research

Collaboration can be a helpful academic tool allowing students to develop their academic skills and professional relationships. This poster presentation will highlight the benefits of professional collaborative relationships throughout a student's academic career related to research and advocacy. The poster will also provide concrete examples of collaboration throughout the campus and local communities. After attending the poster session, the attendee will better understand utilizing collaboration in both the pandemic and post-pandemic eras.
Kelsey Klatka, *Student outcomes related to teachers' use of mindfulness: A systematic literature review*

Teachers and educators in kindergarten through 12th grades have demanding jobs that place an increase on stress and may reduce overall well-being and job performance. Mindfulness-based interventions (MBIs) have been proposed to reduce teachers' burdens and improve teacher efficacy and job performance. Theories have hypothesized that by reducing teacher distress and increasing their ability to positively impact the classroom environment then this may improve student outcomes such as academic performance or student-teacher relationships. The purpose of this study was to review the current literature on MBIs for educators in kindergarten through 12th grade settings and conduct a systematic literature review of the gap exploring the outcomes of MBIs for teachers and the indirect effects that this intervention can have on students. This poster presentation will present the findings of the review.

**PS14: Computer Sciences & Physics**

Niranjan Rai & Xiang Lian, *Top-k Community Search in Large Road Network Graphs*

With the urbanization and development of infrastructure, the community search over road networks has become increasingly important in many real applications such as urban/city planning, social study on local communities, and community recommendations by real estate agencies. In this paper, we propose a novel problem, namely top-k community similarity search (Top-kCS2), which efficiently and effectively obtains spatial communities that are the most similar to a given query community over road-network graphs. In order to efficiently and effectively tackle the Top-kCS2 problem, in this paper, we will design an effective similarity measure between communities, and propose a framework for retrieving Top-kCS2 query answers. Extensive experiments have been conducted on real and synthetic data sets to confirm the efficiency and effectiveness of our proposed Top-kCS2 approach under various parameter settings.

Neha Fnu, Yolov5, *You Only Look Once Object Detection State of the Art algorithm*

Object detection may sound a pinnacle in Artificial intelligence, but it co-exists with us in our lives. However, we often fail to recognize a simple application of object detection around us, for instance face lock. Object Detection is a technology which includes computer vision and image processing used to detect objects in images or videos and at present, there are many algorithms for performing object detection. This paper presents a comprehensive review of systematic advancement of Yolo (You Only Look Once) object detector over the time, including its current version 5. Apart from performing in depth analysis of the Yolo versions, this paper also includes details of other object detection algorithms and their prominent applications. This paper is concluded by listing down the limitations of the existing works and future scope of this research area.

Sajad Shiekh, Golam Mustafa, Mohammed Enamul Hoque, Hamza Balci, & John J. Portman, *Emerging Accessibility Patterns in Long Telomeric Overhangs*
We present single-molecule experimental and computational modeling studies investigating the accessibility and folding landscape of human telomeric overhangs of physiologically relevant lengths. The overhangs contain 4-28 repeats of GGGTTA (G-Tract) sequence and accommodate 1-7 tandem G-quadruplex (GQ) structures. Using FRET-PAINT, we probed the distribution of accessible sites via a short imager strand, which is complementary to a G-Tract and transiently binds to unfolded sites. We report accessibility patterns that periodically change with overhang length and provide insights about the underlying folding frustration. Overhangs that have 4n G-Tracts, (12, 16...), demonstrate maximum frustration, while those with 4n+2 G-Tracts, (14, 18...), have minimal frustration. We also developed a computational model that suggests positive folding cooperativity between neighboring GQs is required for persistence of such patterns. Our experimental and computational studies suggest lower folding stability at the junction between single and double-stranded telomeric DNA, which has implications for Shelterin complex formation.

**OS1: Architecture & Environment**

Leong Yin Tanya Chiu & Sara Bayramzadeh, *How to enhance children's and parents' experience through architectural elements: A survey study*

Visiting healthcare facilities can be extremely stressful for pediatric patients. Studies have shown that positive distractions can lead to lower patient stress which could offer significant benefits for improved experience. However, a comprehensive investigation of factors that influence patient and parent experience is not available. The goal of this study was to explore children's and parents' stress levels when visiting outpatient pediatric facilities and to identify ways to enhance their overall experience. An online survey was distributed to parents with children under 18 years old. The survey included closed- and open-ended questions related to parent and patient stress levels, wayfinding, and infection control measures. A total of 67 participants completed the survey. To lower parents' stress levels, parents suggested reducing waiting times, improving infection control measures, and accessing natural light and outdoor garden will be beneficial. As for children, providing wide age range play options, sensory stimuli, child-friendly furniture, and access to outdoors can help to reduce their stress. Pediatric healthcare environments have a significant impact on children's and parents' stress levels. Architectural elements in waiting rooms, exam rooms, and hallways can act as positive drivers to enhance patients' and parents' overall experiences and incite a desire for them to return for their next visit.

Hossein Mirzajani & Sara Bayramzadeh, *Perceived importance of wellness features to improve end-user experience in cancer centers: Patient and staff perspectives*

Due to the consistent nature of cancer treatments, building features that promote wellness are of increasing interest to the end-users. Current research literature indicates that the physical environment can significantly improve the overall healing process and the quality of care-delivery. Having long-term and frequent treatment process makes the cancer patients more exposed and sensitive to the
physical environment. Building features such as natural light, thermal comfort, noise control, and access to private areas can promote wellness and productivity. Given the diverse population in cancer care facilities, wellness features vary in importance and preference to different end-users depending on their experience with a cancer care facility. This study aims to identify the end-users' preferences of wellness features in cancer centers and its impact on the quality of care delivery for patients and caregivers. This study administered two surveys to two user groups - staff and patients. The surveys were distributed through cancer care facilities and social media platforms using a snowball sampling method. The questionnaires included open- and closed-ended questions, and mostly focused on end-users' preferences in specific areas such as break area, waiting area, and treatment areas. Findings indicated that wellness features were viewed favorably by two groups, with access to natural light/view, thermal comfort, and ease of movement were found for three top categories for both target populations. Wellness features related to sensory stimuli such as thermal comfort, natural lighting, and access to quiet space were highlighted by the participants as being effective in improving the interaction between patients and caregivers, as well as significantly supporting the mental health of both groups. The results of this study emphasize the impacts of wellness features on the overall healing process and can inform the design of future cancer care centers.

Hamid Estejab, *Free Standing Emergency Department: How to enhance wayfinding and user experience*
This study focuses on the understanding of the wayfinding experience of staff, patients, and visitors in the emergency departments (EDs). This subject gives insight to the designers to focus on the design elements and spaces which have been reported frequently based on the experience of the participants. Wayfinding is an important subject in the healthcare settings, that has been under scrutiny of researchers during the past years. ED is one of the complex healthcare environments where a subtle delay in delivering care could result in health-threatening situations, therefore an effective wayfinding approach is pivotal. An online survey method was used to evaluate the wayfinding experience of participants (staff, patients, and visitors) in the EDs. Among respondents, there were 21 staff, six visitors, and three patients. Questions include Likert-scale questions, multiple choices, and open text entry questions. Results revealed that signages and landmarks stand at the top of the list of effective design elements regarding wayfinding. In terms of spaces, treatment rooms and waiting areas are two spaces that participants faced wayfinding challenges. Better signages, room numbering, and bold color scheme were the top priorities of respondents' suggestions to enhance wayfinding.

Alyssa Skilton & Reid Coffman, *Vegetative roof germination of Ohio native coastal species in reclaimed soils: A field study assessing Doellingeria umbellata and Sporobolus compositus*
Increasing human population can lead to decline in local native plant communities. To address this, roofs designed to host native species offer
restoration solution. Although most roof environments use engineered growing media for vegetation, more sustainable approaches could utilize local soils and seeds to mimic natural habitats. This assists in creating abiotic and biotic conditions enabling plant development (Best et al. 2015; Coffman, 2009). To further an understanding of seeding rooftop environments, a germination field study was conducted on two locally sourced substrates at Lakefront Dune Roof (Lake Erie Coast, Cleveland, Ohio). Germination rates of two warm-season native species hand-seeded into two substrates (beach stone and local sand) was observed in four experimental treatments (4 m$^2$) at varying depths. *Doellingeria umbellata* is a prairie wildflower and *Sporobolus compositus* is a perennial prairie grass. Results show that local sand is the more effective substrate for *S. compositus* (33.2%) and *D. umbellata* (0.06%) in Treatment C. Beach stone substrate was less effective, with highest germination rates for *D. umbellata* 0.6% (Treatment D) and *S. compositus* 0.11% (Treatment D). These findings support current understanding of native seed germination on roofs, which allows further development of sustainable and affordable material sourcing for urban conservation.

Md Mazharul Islam, *Safety and Healing Environment in Child and Adolescent Behavioral Health Facilities*

Different research studies were conducted focused on healing design elements and safety in the context of pediatric and adult behavioral health facilities. Little research focused on the significance of building appearance and restorative design elements in the context of child and adolescent behavioral health facilities. The purpose of this study is to explore the potential of healing design elements and safety features of child and adolescent behavioral health facilities from staff and parents' perspectives. Two separate online surveys were conducted where 35 staff and 10 parents participated across the United States. The findings underlined the significance of building’s appearance to create a welcoming environment and identified potential design elements to create a healing environment while supporting staff efficiency and safety. Sensory room, quiet room, play area, and activity areas are found most useful areas to accelerate patients healing. From finish material perspectives, natural and home-like finish both in interior and exterior appeared to be most recommended by staff and parents. Staff and parents' perception could be an important consideration to create a welcoming and home-like environment without compromising safety features in child and adolescent behavioral health facilities.

**OS2: Biological Sciences**

Jordyn Stoll & David Costello & Paisley Kostick, *How do metals impact phytoplankton and stream biofilm primary producers?*

Metals (e.g. iron, zinc, molybdenum, manganese, nickel) play important roles as micronutrients in aquatic primary producer metabolism, facilitating processes such as nutrient processing and photosynthesis. Our current understanding of metal use in specific metabolic processes allows us to make predictions about metal demand in algal communities; however, empirical data demonstrating the
The magnitude of effect metals have on in situ communities is limited. Determining how algae communities respond to metal enrichment at non-toxic, nutritive concentrations in situ allows researchers to test predictions regarding metal use and scale up metal effects to the ecosystem level. We have conducted metal and macronutrient enrichment experiments in numerous stream and lake systems to determine the effect metals have on biofilm and phytoplankton growth, community composition and specific nutrient uptake processes such as alkaline phosphatase activity. Our results suggest that, while metals play critical roles in numerous processes, the amount of metals bioavailable in midwest natural ecosystems rarely limits the processes we measured. The effect of macronutrient enrichment far exceeds the effect of metal enrichment in all of our studies. We have identified instances where metals become limiting after macronutrients are provided (serial limitation), and alter primary producer community composition, but not in drastic ways. As much variation in algal community responses cannot be explained by macronutrients, we conclude that metals deserve further examination in freshwater systems, specifically to pinpoint the smaller effects that metals have on algal community composition and specific processes that metals are used in.

Sayoni Dutta, Xiaozhen Mou, & Laura G Leff, *The problem with drugs: Effects of widely used pharmaceuticals on the behavior and oxidative stress biomarkers of crayfish*

A large quantity of pharmaceuticals and personal care products (PPCPs) intended for human use are released into the environment after consumption. The freshwater crayfishes are distributed worldwide and serve as important keystone species and ecosystem engineers. Environmental PPCPs can induce various harmful effects like reproductive alterations, oxidative stress, immunosuppression, and histopathological changes on aquatic biota. Antibiotics like sulfamethoxazole and trimethoprim have been found to affect the gut microbiome of crayfishes. However, no information is available regarding the effects of estradiol, cotinine, and carbamazepine on the crayfish microbiome. There's also very little information about the oxidative stress of crayfish post-treatment with the targeted compounds. The primary aim of this study was to 1) Observe the change in the gut microbiota of crayfish before and after PPCP treatments and 2) Investigate oxidative stress in crayfish after the targeted PPCP treatment. Crayfishes were collected from the stream in Jennings, Kent, and acclimated for a week before starting the PPCP exposure experiments. The crayfish were subsequently exposed to concentrations of 10 and 100 µg/L for 96 hours. The biochemical activities of catalase, superoxide dismutase, and glutathione reductase were observed for analyzing oxidative stress from hepatopancreas, gill, and carapace.

Amber Titus, Alyssa Reinagle, & Edgar Kooijman, *lipid droplet binding properties of perilipin 3 in model systems and adipocytes*

Lipid droplets (LDs) are ubiquitously expressed organelles; the only intracellular organelles that contain a lipid monolayer rather than a bilayer. Proteins localize and bind to this monolayer as they do to intracellular lipid bilayers. However, the
mechanism by which cytosolic LD binding proteins recognize, and bind, to this lipid interface remains poorly understood. Amphipathic α-helix bundles are a common motif found in proteins that are known to bind intracellular lipid droplets and lipoprotein particles. Here, we use perilipin 3 as a model cytosolic LD binding protein which contains an amphipathic α-helix bundle at its C-terminus. We examine the lipid binding specificity of this C-terminal amphipathic α-helix bundle versus the full-length protein. We use pendant drop tensiometry to measure the recruitment and insertion of perilipin 3 at multiple mixed lipid monolayers at a buffer-phospholipid-oil interface. We also use live-cell fluorescence microscopy to determine the difference in LD localization of full-length perilipin 3 versus the C-terminal α-helix bundle truncation and a mutant of this C-terminal α-helix bundle in 3T3-L1 cells. Our results strongly support a model whereby both the N-terminal 11-mer repeat region and C-terminal amphipathic α-helix bundle domains of perilipin 3 have distinct lipid sensing and/or binding, and potentially biological roles.

Fanan Aboalrob & Zackery T. Knauss, Early-Life Maternal Separation Sex-Dependently Alters Fentanyl Seeking in Adolescence and Adulthood

Survivors of early childhood neglect (ECN) are 4.5 times more likely to develop opioid use disorder (OUD). Thus, we explored the effects of maternal separation (MS), a potent form of ECN, on fentanyl-induced seeking behavior during adolescence and adulthood in rats. Pups were cross-fostered at birth and either received 3-hour daily MS (P2-P18) or not. Rats were then assigned to adolescent (P32) or adult (≥P50) place conditioning for eight days under one of four conditions: 1) control–saline, 2) control–fentanyl, 3) MS–saline, or 4) MS–fentanyl. Extinction testing was conducted 24-hours post-conditioning for three days during adolescence and for eight days and then weekly in adulthood until day 91 or extinction criteria were reached. We found that MS enhanced the magnitude and persistence of fentanyl-seeking behavior in adolescent and adult males as compared to control non-MS rats. In contrast, MS impaired the formation of fentanyl-seeking behavior in adolescent and adult female rats as compared to control non-MS rats. MS induced a significant, but sex-dependent, alteration in the expression of fentanyl-seeking behavior during adolescence and adulthood in rats that is consistent with findings from human studies. Thus, this model can be used for exploring the neurobiological mechanisms behind this phenomena.

Younguk Kim & Angela Ridgel, Effects of Patient-specific Adaptive Dynamic Cycling on Motor Symptoms, Quality of life, and Functional Performance in Individuals with Parkinson’s Disease

To determine how patient-specific settings in entropy of cadence alter the effectiveness of adaptive dynamic cycling. Twenty individuals with idiopathic Parkinson's disease ages 50-79 will be randomized into one of two groups: patients-specific adaptive dynamic cycling or non-adaptive dynamic cycling. Both groups will complete 12 cycling sessions. For the patient-specific adaptive dynamic cycling group, the optimization process will be based on sample entropy
of cadence calculation from the previous session’s cycling performance and will be completed done after the 3rd, 6th, and 9th sessions. Individuals randomized to the non-adaptive group will ride the dynamic cycling with pre-determined settings. UPDRS III, Timed Up and Go, PDQ-39, and the Physical Performance Test will be collected at baseline and after the completion of the 12 exercise sessions. Kinesia One will be used to assess motor performance before and after each exercise session. UPDRS III, PDQ-39, PPT, and TUG variables will be analyzed using Repeated measures ANOVA (2 groups at 2 time points). Kinesia One variable will be analyzed with a Repeated measures ANOVA (2 groups by 12 time points).

OS3: Chemistry & Biochemistry

Payel Datta, Development of Pt-Ru conjugates toward elimination of drug resistant ovarian cancer

The enduring effect of cancer is relapse of the disease by drug resistance to conventional Pt-based chemotherapeutics. The cause of this resistance is believed to associate with Cancer Stem Cells (CSCs). Due to their intrinsic features including enhanced DNA damage repair ability, overly expressed anti-apoptotic proteins, drug efflux transporters. Till date, there is no effective treatment to exterminate CSCs in cancer. Studies have shown that CSCs found in various cancer types favor oxidative phosphorylation in mitochondria for their energy production. They also contain a higher mass of mitochondria compared to non-cancerous cells. Triggering mitochondrial damage is thus expected to eliminate CSCs overcoming drug resistance in cancer therapy. In this current project, we have designed and characterized a Pt(IV)-Ru(II) binuclear metallodrug to target mitochondria. The structure being Pt(IV) and bound to Ru(II) with moderately strong ligand is expected to show less systematic toxicity. The overall structure being cationic is expected to target negatively charged mitochondrial membrane, reducing membrane potential. The Pt counterpart after cell internalization gets reduced to Pt(II) which successfully shows DNA double strand breakage and finally initiates cell death via apoptosis mediated pathway.

Amarasooriya Jayawardhana & Srijana Bhandari, Visible light-activatable Platinum(IV) prodrugs harnessing CD36 for ovarian cancer therapy

In this work, we present the first study about the interactions of mitochondria-damaging Pt(IV) prodrugs with cytochrome c. We synthesized a cisplatin-based Pt(IV) prodrug bearing a lipophilic hydrocarbon tail and anionic dansyl head group. The amphiphilic structure facilitates its accumulation in the mitochondria of cancer cells, which was validated using graphite furnace atomic absorption spectroscopy (GFAAS) and fluorescence imaging. Accordingly, this Pt(IV) prodrug is able to trigger mitochondrial damage and apoptosis. Overall, the Pt(IV) prodrug exhibits superior therapeutic effects against a panel of human cancer cells compared to cisplatin. It also overcomes drug resistance in ovarian cancer. Notably, HPLC analysis indicates that cytochrome c accelerates reduction (or activation) of the Pt(IV) prodrug in the presence of the electron donor
nicotinamide adenine dinucleotide (NADH). More interestingly, additional studies indicate that cytochrome c was platinated by the reduced product of Pt(IV) prodrugs, and that empowers the proapoptotic peroxidase activity.

Dinesh Marasinghe & Michael J. Tubergen, *Conformational Analysis of Valine Methyl Ester by Microwave Spectroscopy*

The rotational spectra of valine methyl ester (ValOMe) conformers have been measured using a cavity based Fourier-transform microwave spectrometer in the range of 9-18 GHz as a part of the project of investigating the structural information of a series of amino acid methyl esters. We modeled 15 possible conformers of ValOMe using the ωB97XD/6-311++G(d,p)) level of theory. Separate spectra arising from two different most energetically favorable conformers were observed and assigned. 59 rotational transitions were fit to Watson's A-reduced Hamiltonian: $A=2552.01(1) \text{ MHz}$, $B=1041.821(2) \text{ MHz}$, and $C=938.549(2) \text{ MHz}$. 14N nuclear quadrupole hyperfine splittings were resolved, and the 137 hyperfine components were fit to $\chi_{aa} = -4.20(2) \text{ MHz}$ and $\chi_{bb} - \chi_{cc} = 1.26(1) \text{ MHz}$ for conformer I. The spectrum of conformer I also reveals tunneling splittings from the ester methyl rotor. The XIAM program was used to fit the barrier to the internal rotation of the methyl rotor. The best fit V3 barrier was found to be 387.8(8) cm$^{-1}$ for conformer I. 20 rotational transitions were assigned for conformer II and the fitted rotational constants are $A=2544.405(9) \text{ MHz}$, $B=1092.337(2) \text{ MHz}$, and $C=896.301(1) \text{ MHz}$. The transitions were split by nuclear quadrupole coupling and tunneling; assignment of these components is ongoing.

Michael Carrillo, Lindsey Speare, Dinesh Marasinghe, & Michael J. Tubergen, *Rotational Spectrum of 2-iodoethanol and its Large Iodine Nuclear Quadrupole Coupling Constants*

In 2021, a study published in Science titled "Ozone depletion due to dust release of iodine in the free troposphere" mentions how iodine is found and produced and its deleterious effects on our ozone layer (doi/10.1126/sciadv.abj6544). Iodine is susceptible to photodissociation, which produces a free iodine atom that makes its way into the stratospheric ozone (O3) layer. Here, the iodine cleaves the ozone molecule leading to the formation of iodine monoxide (IO) radical. This radical is known to increase the lifespan of methane in the atmosphere contributing to global warming. Even though iodine is utilized in industries such as pharmaceuticals, disinfectants, dyes, and catalysis, its main source of production arises from marine life and the ocean's surface. It is important to study iodine-containing molecules to find a mechanism to prevent iodic molecules from making their way into the atmosphere, contributing to ozone depletion and global warming. In order to understand how reactive a molecular system is, one must first understand its structure. In this presentation, we report the microwave rotational spectroscopic observation of 2-iodoethanol and its iodine nuclear quadrupole coupling tensor. Not only does this allow us to obtain structure information about 2-iodoethanol, but it also helps us better understand the bonding nature between carbon and iodine the (C-I) bond. High level ab initio
calculations at the CCSD(T)//MP2/6-311++ level were used to model the molecular structure, rotational constants, and hyperfine constants. A potential energy surface scan was implemented along the H-C-C-I dihedral angle at the B3LYP/6-311G++ level of theory to obtain a better understanding of this molecule's conformational landscape. The same method and basis set was also used to obtain the calculated centrifugal distortion constants and zero-point vibrational corrections. A molecular beam cavity-based Fourier transform microwave spectrometer in the frequency range of 9.4-18.0 GHz was used to obtain the microwave spectrum, and a semi-rigid rotor Hamiltonian perturbed by hyperfine interactions was used to fit the spectrum. The rotational constants, centrifugal distortion constants, complete nuclear quadrupole coupling tensor, and nuclear-spin rotation constants of the iodine nuclei have been determined and reported herein. This study provides new detailed information about the carbon-iodine bond as well as the intramolecular hydrogen bonding between the -OH moiety and the iodine. This type of investigation will help guide new studies on ionic molecular systems in the atmosphere.

Mohammed Enamul Hoque, Hamza Balci, & Soumitra Basu, *CRISPR/dCas9-mediated in vitro transcription regulation in the vicinity of DNA G-quadruplex structures*

The prevalence of potential G-quadruplex forming sequences (PQS) in the human genome and their impact on transcription, replication and DNA repair provides challenges and potential new applications for CRISPR technology. Using the nuclease-dead Cas9 (dCas9), we targeted in cellulo a G-rich sequence, which contains multiple PQS and demonstrated that transcription can be up or down regulated by targeting different parts of this G-rich sequence. Our results suggested that transcription levels correlate with stability of different G-quadruplexes (GQs) formed by this sequence and targeting them with dCas9 can modulate their stability. Here, we investigated the interactions of RNA polymerase (RNAP) and dCas9 in the vicinity of a PQS to gain mechanistic understanding of dCas9-mediated transcription regulation. In the absence of dCas9, polymerase stop assays have shown truncated transcription or replication at PQS and without PQS polymerase stop assays have exhibited blockade at the dCas9 targeted sites. However, how RNAP functions in the vicinity of a PQS that is already targeted by dCas9 is not known. In our study, we have found that dCas9 facilitates the RNAP progression when both dCas9 and GQ present at the template strand of T7 RNAP transcription. We have also observed that the dCas9 served as the dominant blockade compared to the GQ stalls when dCas9 target site is on the non-template strand of T7 RNAP progression. This study will unravel a new mechanistic pathway of in vitro transcription regulation by CRISPR/dCas9 system in the vicinity of DNA GQ structures.

**OS4: Individuals and Community**

Paul Geis, *Distraction in the contact zones: Benjaminian wandering as study abroad in the city*
My research bridges between the humanities-oriented inquiry of philosophy and the applied contexts of international education practices. In this paper, I posit students studying in the cities of Europe as being in the "contact zones" and contend that these locations are educationally valuable as such. Further, I engage with the writings of Tyson Lewis and his revisiting of Walter Benjamin's concept of distracted wandering as a form of study. I contrast this with the problematic, highly-attentive actions of the flâneur. In applying these concepts from philosophy of education to these novel contexts, I am expanding the field's scholarly considerations to an oft-overlooked sector of U.S. higher education.

Beth Nahlik, “To make this leap”: Understanding relationships that support community college students' transfer journeys
Utilizing social and transfer capital frameworks, we investigated the types of social support community college students rely on when transferring to a four-year institution. Participants (n=29) drew support not only from relationships with institutional agents but also those outside institutions, suggesting a need to incorporate the latter into transfer capital frameworks.

Sebiha Balci, Bradley J. Morris, The effect of gamification on intrinsic motivation and performance of online learners
Gamification is a promising method proposed to solve the motivational problems of online learners and enhance their performance. However, the evidence regarding why and how gamification might work and its effects on these outcomes are inconclusive. In order to provide more evidence to the ongoing discussion in the gamification field, the current study searched for the effectiveness of gamification on the intrinsic motivation and performance of online learners. Applying the tenets of Self-determination theory as a theoretical background, a gamified online learning environment with badges and freedom of choice was created in a learning management system. Preliminary results will be shared about the effectiveness of gamification on online students’ intrinsic motivation and performance.

Yunhe Wu, Father Hurry Up, Send Money Home: ” Seeking Cantonese Manhood in the California Gold Rush, from 1849 to 1859
This chapter focuses on the masculinity crises these young Cantonese men confronted both in Guangdong and California in the 1850s, suggesting that their migration to California did not settle their initial masculinity crisis but reinforced their sense of loss of manhood. In other words, Cantonese men hardly became men in America West due to the locals’ need of the remapping of racial relationships concerning the citizenship. Recent scholars demonstrate that the racialization of Chinese immigrants in the West was a crucial block of the political orders during the Reconstruction era, particularly dominated group’s ideas of citizenship in California. However, this chapter suggests that rather than starting in the Reconstruction era, the racist discourse about Chinese immigrants had been an important tactic for the white majority to maintain their "traditional" privileges in the name of protecting Anglo-Saxon manhood but also defending
American citizenship since the California Gold Rush era when an increasing number of male workers with diverse racial and ethnic backgrounds came to the West Coast to compete with white Americans for economic opportunities and blur the racial boundaries. Moreover, by incorporating Chinese language sources which haven’t been used very often by previous historians into this discussion, it also tries to narrate a story of this interracial power struggle from the eyes of Chinese immigrants.

Anne Garwig, English

Sex Positivity in Fanny Fern's Ruth Hall

This presentation will discuss sections of Fanny Fern's 1854 roman à clef "Ruth Hall" as a precursor to contemporary feminist notions of sex positivity.

OS5: Effects of Environmental Change

Anna Solberg, Community perceptions of vegetation change in Queen Elizabeth National Park, Uganda

Queen Elizabeth National Park (QENP) is Uganda's premier protected area, with a varying landscape and serving as a major tourist destination within the country. QENP has been facing substantial changes with regard to vegetation and an increase of development in and around its borders. Researchers believe QENP has particularly been encroached by invasive woody plants over the last few decades. This habitat change is said to be impacting the spatial distribution of grazing mammals, which are leaving the park for cleared private lands. This research investigates the community perceptions of habitat change and sustainable development in and around QENP. These perceptions validate that local vegetation has been changing, but not entirely as researchers had shared. Three major elements were described by communities: environmental change through climate change, invasive species, and tree cover; increased human-wildlife conflict; and the need for further community engagement. This project relates to a larger ecological study by researchers at Kent State University with local support from the Uganda Wildlife Research and Training Institute.

Josie Myers, Mapping Community Perceptions of Walkability in Small Town Minnesota

This research will investigate walking as a form of transportation in small towns, by working to identify perceived barriers and facilitators of walking. The two main objectives of this project are to recognize and acknowledge perceived barriers to walkability in small towns and to better understand how community perceptions of walking can help to shape more walkable small towns. Quite a bit of research has been published on walkability in urban areas, but very little published research exists on utilitarian walking in rural areas and small towns. Many small towns do have the basic infrastructure to support walking, but the human element in making the decision to walk or drive often sides with the norms of the community and it is important to understand that no two people will have the same experiences walking and those individual choices to walk or not differ greatly based on a wide range of forces and factors. This research uses a mixed-methods exploratory design, with a quantitative online survey informing one-on-
one qualitative interviews and sketch mapping to learn about perceptions of walking in Hutchinson, Minnesota.

**Zia Ul Hassan & Anne Jefferson, Assessment of Climate Change Impacts on Cleveland (Ohio) Urban Streamflow**

Continuous changes in precipitation patterns and rising air temperatures due to climate change are expected to have a significant impact on both high and low flows in streams. Understanding the impacts of climate change on the flow regime of urban streams is particularly important, given the high population densities and critical infrastructure located in urban watersheds. We evaluate the impact of projected 21st century climate change on the flow regime of the 20.6 km², 30.3% impervious West Creek watershed (Parma, Ohio), using a calibrated PCSWMM model. Precipitation and temperature outputs of four regional climate models (RCMs) project mean annual precipitation increases by up to 14-36% by the mid 21st century (2046-2070). The analysis of different return periods of stream flow is performed across the four different periods and results indicate that there will be an increase of 10-113% for the 2-year flow, -8-98% for the 5-year flow, and -5-102% for the 10-year flow as compared to the historical period. The results from event-based analysis of precipitation and rainfall indicate that there will be more frequent rainfall in the future with greater intensity that will lead to higher peak flows into the stream. These changes will increase flood risk and decrease the performance of existing green and gray infrastructure. Installation of new infrastructure, sized appropriately for future climates, may increase the resilience of urban watersheds to some of the effects of climate change.

**Daniel Wilcox & Michelle Bebber, The Shift from Soapstone to Pottery in Eastern North America During the Late Archaic and Early Woodland Period: An Experimental Approach**

This research examines the decline of soapstone vessels and the adoption of pottery for cooking at the end of the Late Archaic (5,000BP to 3000BP) into the Early Woodland Period (3,000 BP to 2,000 BP). The reasons for this change in cooking technology have been debated by scholars. Several hypotheses have been put forward which consider factors such as change in diet, vessel characteristics, and vessel production. However, very few experimental studies have assessed the physical processes involved in the production and use of soapstone bowls compared to early clay vessels. Here, to better understand this change in cooking technology and generate comparative data, an archaeological experiment was conducted which involved the replication of vessels made from soapstone and natural clay. Thermal properties, including heat retention, transfer, and thermal shock resistance, were examined by heating the two vessel types over an open fire in a cooking experiment. This study provides insight regarding the replacement of soapstone vessels with those made of clay during the Early Woodland Period and provides new information regarding the costs and benefits for each technology.

**OS6: Liquid Crystal & Math**
Senay Ustunel Marianne Prévôt, Robert J. Clements, & Elda Hegmann, 3D Printed Fully Biocompatible Porous Liquid Crystal Elastomer Scaffolds as Cell Supports for Long-term Tissue Cultures

We synthesized, designed and created three-dimensional (3D) Liquid Crystal Elastomer (LCE) scaffolds as support for cell lines to promote tissue regeneration. Creating 3D tissue scaffolds would produce suitable environments for cells to grow and proliferate for longer periods of time compared to traditional 2D petri dishes. We have shown that our LCEs can be 3D-printed, thereby bringing our scaffold studies to a higher level of expertise and applications. Our LCEs can be printed to exactly replicate tissue vessels and cell formations all while continuing to use the LC anisotropy to guide directionality and alignment of cells. We have shown that human dermal fibroblast (hDF) cells grown, proliferated for over four weeks and cells were aligned along the 3D printed fiber LCE. Creating a tissue scaffold by using 3D printing gives excellent spatial precision in addition to tunable mechanical properties imparted by the LCE. I will present how our 3D-LCE scaffolds provide a unique environment and simple method to longitudinally study cell functions, not always possible in conventional culture environments, as well as how LCEs can be a new platform for extended in vitro lifespan allowing the study of developmental and ongoing events allowing for in-depth, long-term study, and manipulation.

Matthew Deutsch & Robin Selinger, Twist and snap: Heterogeneous defect nucleation via Frank-Read sources in nematic liquid crystals

Topological defects can nucleate heterogeneously, as when a pinned dislocation segment in a crystalline solid bows out under applied stress and snaps off repeatedly to form an emerging set of concentric dislocation loops, a mechanism known as a Frank-Read source. A similar mechanism can arise in a nematic liquid crystal containing a pinned disclination segment. To study this fundamental mechanism, we consider a disclination half-loop pinned to a planar anchoring layer containing point defects. When a director twist is imposed on the top substrate, while keeping the bottom substrate fixed, the half-loop expands outward and eventually snaps off a new disclination loop leaving the original half-loop intact. We model this heterogeneous nucleation mechanism in a liquid crystal using a 3D Lebwohl-Lasher rotor model, representing a uniaxial nematic with equal Frank constants. Our simulations demonstrate the Frank-Read mechanism and we explore effects of temperature and twist rate. Using a materials-by-design approach, we propose that an engineered liquid crystal cell with a patterned array of Frank-Read sources will demonstrate rheological response that depends on disclination half-loop sizes, density, orientation and pattern. We discuss the importance of this mechanism in rheology of both passive and active nematics.

Xinfang Zhang, Structure and optical properties of twist-bend nematic liquid crystals doped with chiral dopants

In recent years, twist-bend nematic phase (TBN), as a very interesting new liquid crystal (LC) phase, has been experimentally found in the systems with bent-
shaped LC molecules, including LC dimers and bent-core LCs. The structure of the TBN phase is characterized by the cone angle and helical pitch. We add chiral molecules into the TBN system and study their effects on the structure and optical properties of the TBN phase. Combining experimental measurements with theoretical calculation, we verify that the addition of the chiral molecules does not induce a twist of the conic helical axis. By fitting transmission spectrum, we get the cone angle of the TBN phase increasing with the concentration of chiral molecules. Moreover, the numerical relationship of the increment of structural chirality parameter and intrinsic chirality parameter is obtained. Further, the pretransitional phenomenon is observed that the helical pitch in cholesteric phase increases dramatically when temperature is decreased toward the phase transition temperature. Our study will help understand the effect of chiral molecules in liquid crystals.

Runa Koizumi, Hao Wang, & Oleg D. Lavrentovich, *Liquid crystal elastomer coatings with patterned dynamic profile driven by visible light*

Liquid crystal elastomer (LCE) coatings with a prompt response to external stimuli promise a broad range of applications, ranging from robotics to self-cleaning and tissue engineering. In this work, we design a new tetrafluoroazobenzene based diacrylate monomer and create a mixture with commercially available acrylate-based monomers to polymerize an LCE capable of a reversible topography change under visible light irradiation. In-plane director patterns with splay and bend distortion are pre-imposed onto the elastomer coating using a photopatterning technique. Upon irradiation with green light, the locations of bend distortion show an elevation in topography by approximately 200 nm, while locations of splay show depletion of 200 nm. The surface topography is also highly responsive to thermal changes. The advantage of the demonstrated LCE coating is that it responds to visible light, which is harmless for biological species, in contrast to blue or UV light.

Lucas Onisk, Alessandro Buccini, & Lothar Reichel, *A preconditioned Arnoldi-Tikhonov method for the solution of linear discrete ill-posed problems*

Many problems in science and engineering give rise to linear systems of equations that are commonly referred to as large-scale linear discrete ill-posed problems. These problems arise, for instance, from the discretization of Fredholm integral equations of the first kind. The matrices that define these problems are typically severely ill-conditioned and may be rank-deficient. Because of this, the solution of linear discrete ill-posed problems may not exist or be extremely sensitive to perturbations caused by errors in the available data. These difficulties can be reduced by applying Tikhonov regularization. We describe a novel "approximate Tikhonov regularization method" based on constructing a low-rank approximation to the matrix in the linear discrete ill-posed problem by carrying out a few steps of the Arnoldi process. The iterative method so defined is transpose-free. Our work is inspired by Donatelli and Hanke whose approximate Tikhonov regularization
method seeks to approximate a severely ill-conditioned block-Toeplitz matrix with Toeplitz-blocks by a block-circulant matrix with circulant-blocks. Computed examples illustrate the performance of our proposed iterative regularization method.

**OS7: Liquid Crystal & Physics**

Mojtaba Rajabi, Hend Baza, Hao Wang, & Oleg Lavrentovich, *Active matter: Extracting useful work from chaotic motion of micro-swimmers using a nematic environment*

Active matter is a class of material that its units convert the ambient or stored energy of their environment into systematic motion. Living systems such as flocks of birds, schools of fish suspensions of bacteria, and artificial systems such as active colloids are a few examples. An ambitious goal of active matter science is to extract useful work from the chaotic dynamics of its units. In this work, we report on an approach to extract useful work from the random motion of swimming bacteria in form of propulsion of their droplet container using a nematic liquid crystal environment. The responsiveness of liquid crystals to electromagnetic fields provides means to dynamically control the trajectories and speed of the active drops. Self-locomotion and controllability of active drops make them an ideal candidate to be used as future micromachines.

Golam Mustafa, *Impact of Molecular Crowding Conditions on Stability, Folding Landscape, and Accessibility of Long Telomeric Sequences*

The interior of living cells is very crowded due to high concentrations of soluble and insoluble biomolecules including nucleic acids, proteins, polysaccharides, and metabolites. These biomolecules occupy up to 40% of the volume of a living cell, leading to molecular crowding conditions which significantly impact stability and kinetics of nucleic acid secondary structures, including G-quadruplexes (GQ). GQs form at the single stranded overhang of telomeres and are important for capping and protecting these otherwise vulnerable genomic regions. Also, GQs are known to inhibit telomerase activity which is upregulated in most cancers. We studied the stability and folding patterns of single stranded telomeric sequences of physiologically relevant lengths (up to 150 nt long) using single-molecule FRET-PAINT method under dilute and crowded conditions. We observed significant changes in stability, folding landscape, and accessibility of telomeric sequences in the presence of polyethylene glycol (PEG-200), a molecular crowding agent. Under crowded conditions, the accessibility of telomeric overhangs to a small probe (a complementary PNA strand) consistently decreased for all telomere lengths we studied, which suggests higher stability and more compact structures. In addition, crowded conditions resulted in a prevalent increase in folding frustration for all telomeric constructs.

Panambara Mudiyanse Sineth Kodikara, Prabesh Gyawali, Hamza Balci, & Samuel Sprunt, *Liquid crystalline phase of GDNA*

We used small-angle/wide-angle x-ray scattering (SAXS/WAXS) and polarizing optical microscopy (POM) to study the liquid crystalline phases of “gapped” DNA (GDNA) in an aqueous solution. We observed different liquid crystalline
phases that were orientationally and positionally ordered which depend on temperature, concentration, and the number of single thymine bases between the DNA duplexes. For a 10-thymine gap DNA system, at high concentration, we observed higher smectic ordered phases that gradually melt to a lower ordered smectic phase as concentration is decreased or temperature is increased. Two distinct layer structures: “bilayer” with the layer spacing equal to the two duplex lengths and a “monolayer” with the layer spacing equal to the one duplex length were observed and the bilayer structure melted away whereas the monolayer structure persisted at high temperature.

Mitch Powers, Parikshit Guragain, Robert J Twieg, & Brett Ellman, *Polymorphism in tail free discotic liquid crystals*

Discotic liquid crystals are disc shaped molecules that stack into long columns. Typically they have rigid molecular cores surrounded by long flexible tails which form a soft buffer region between column. In this talk we will discuss tail free discotic liquid crystals, which possess a liquid crystal mesophase without the need for tails. In addition to the liquid crystal mesophase, a number of these compounds exhibit rich polymorphism, which may provide clues to the origin of their unusual behavior.

**OS8: Liquid Crystal**


Discotic liquid crystals (DLCs) are disc shaped molecules, typically with a flat rigid aromatic core functionalized with long flexible tails about the periphery. Here two series of novel triphenylene based discotic liquid crystals are synthesized using synthetic methods including photocyclodehydrofluorination (PCDHF) reactions, SNAr reactions, and Suzuki reactions. The first series comprises tetrafluorinated tetraalkoxy triphenylenes with tail lengths ranging from methoxy to hexyloxy. The second series is prepared from the first series and comprises difluorinated hexaalkoxy triphenylene molecules with tail lengths ranging from methoxy to hexyloxy. The latter hexaalkoxy series is directly comparable to the well-known HAT series. These new compounds are interesting because they have retained their mesomorphic properties despite having drastically shorter tails than are typically found in discotic liquid crystals.

Hend Baza, Yuhan Wang, Mojtaba Rajabi, Hao Wang, & Oleg D Lavrentovich, *Command of active droplets by patterned topological defects and laser tweezers*

Nematic liquid crystal environment enables directional propulsion of spherical droplets representing aqueous dispersion of bacterial microswimmers. Here we explore how the dynamics of active droplets can be controlled by patterning the nematic environment with nonsingular director field. We use the plasmonic metamasks technique to pattern the director in the form of non-singular disclinations. We demonstrate that interactions of the active droplet with the director gradients of the environment can be used to control the propagation
direction, speed, and locations of traps that stop propulsion. However, the manipulation of colloids in liquid crystals by laser tweezers is known for decades, the inclusion of living organisms provides limitations on the laser wavelength and power. Here, we use an azobenzene dye that has a trans-to-cis photoisomerization in the visible range that causes melting of the nematic phase with a low-power laser at room temperature and enables us to move the droplets and reorient their motility. Using 2D patterned nematic LCs and laser tweezers, one can guide the active droplets along complex routes with pre-designed points of residence.

Zoltan Karaszi & Antal Jakli, *The devil is in the details Runa*

The devil is in the details: A multivariate model of the effects of proofreading on the mental health of KSU graduate students.

Chathuranga Prageeth Rajapaksha, Pushpa Raj Paudel, P. M. Sineth G. Kodikara, Björn Lüssem, Antal Jákli, Drona Dahal, Thiloka M. Dassanayake, & Vikash Kaphle, *Ionic liquid crystal elastomers-based flexible organic electrochemical transistors*

Organic electrochemical transistors (OECTs) have attracted great attention since their discovery in 1984 due to their flexibility and biocompatibility. Although an intense focus has been put on the design of new organic semiconductors, fewer efforts are directed toward the development of optimized electrolytes. However, the electrolyte is an integral part of OECTs and strongly influences the transient responses of these devices. Also, best performing OECTs currently use liquid electrolytes, but there is a growing need for solid electrolytes, as they can be easily integrated into wearable devices. We demonstrate that ionic liquid crystal elastomers (iLCEs) can be used as solid electrolytes of flexible, substrate-free organic electrochemical transistors. We introduce the alignment of the director of the liquid crystal elastomers as a new parameter to tune and improve both steady state and transient responses. The normalized maximum transconductance $gm/w$ of the most sensitive iLCE was found to be the highest (7 Sm$^{-1}$) among all solid state-based OECTs.

**OS9: Economics and Politics**

Muhammad Hassan Bin Afzal, *Shifting Trends in Legislative Politics and Public Perceptions of Immigrants and Immigration Policies During Health Crises*

Scholarly studies show that policy entrepreneurs (PE) often influence the policy agenda formation process by linking major crises and/or events to a policy problem, even if the event has little to do with the subject they seek to advance. Nonetheless, no mixed-method academic research on the impact of public health crises on the well-being of immigrants as a result of legislative immigration policies and their long-term socio-political ramifications has been conducted so far. My Ph.D. study seeks to fill this gap in the literature by investigating the rising prevalence of immigration policy agenda-setting amid global health crises and how tailored legislative agenda-setting affects immigrants and public opinion of immigrants.
Michael Palmieri, *Transformational Workplaces: The Economic and Political Benefits of Employee-owned companies*

Economic Inequality in the US is at unprecedented levels. But in our polarized political climate we can't agree on remedies to the issue. However, there is a bi-partisan policy that decreases economic inequality: the expansion of employee-owned firms—where employees are provided a financial stake in the company they work. Research on employee ownership demonstrates that such businesses provide higher wealth and income, more stable employment, and increased workplace participation—compared to conventional businesses. Interestingly, these workplaces generated benefits are the same factors that political scientists find lead to increased civic engagement. But these two literatures remain largely separate. Using the General Social Survey my research asks the question: what economic benefits do employee-owned firms provide workers, and are these benefits associated with other positive behaviors, like increased civic engagement?

Md Harun Or Rashid, *Pandemic, Neo-Slavery and the Garment Factory Workers in Bangladesh*

This article explores how the COVID-19 pandemic and the lockdown impacted the Garment workers in Bangladesh, which we can analyze under the framework of new slavery. It focuses on the internally migrated workers from different regions of Bangladesh working in the garment factories in the capital city — Dhaka. The COVID-19 forced lockdown caused factory shutdowns and left workers with no work and income. During the lockdown, neither the owners nor the state provided compensation or livelihood security. Instead, the owners compelled the workers to join their work amidst lockdown, leaving them vulnerable to Covid-19. Based on the newspaper mapping and Key Informant Interviews, this paper argues that the pandemic and the lockdown had increased the already marginalized Garment workers’ vulnerability to the neo-slavery, committed jointly by the state and the corporate sector. In this case, the state failed to ensure the accountability of the owners as the owners violated the labor rights. Also, the state outsourced its responsibility in providing livelihood security and labor rights to the corporate sector. The combination of the state’s failure and the owners’ violation of labor rights created conditions that resulted in the neo-slavery.

Adhik Badal, *Ethnic uprising in Nepal’s Tarai: The making of Madhesi identity in the post-civil war transition*

This research studies ethnopolitical groups and political realignment in post-conflict context, with implications for identity, and peace studies. There is a rich scholarly interest in understanding how post-war societies move forward after the war ends. An interesting strain of this investigation in post-war Nepal is the mobilization of previously marginalized populations and their identities. Following the Maoist insurgency (1996-2006), the rise of Madhesi identity, the surge in violence, and the popularity of Madhesi ethnopolitical groups in southern Nepal known as Tarai/Madhes were unprecedented. These dynamics added a
layer of complexity to the political landscape of Nepal, emphasizing the need for dialogue and negotiation as integral to the resolution process. This project aims to understand how Madhesi identity was created after the conflict. It analyzes how Madhesi ethnopolitical groups articulated Madhesi identity in the post-war transition. It asks why a diverse section of the Madhesi population accepted Madhesi rhetoric of ethnic identity, targeted against the state and hill-ethnic groups in a way rarely seen in Nepal before 2007. In this case study, I conducted interviews with Madhesi leaders and their supporters. I am also analyzing relevant documents to understand the shift in popular support for Madhesi identity in the post-war period.

Jack Herman & Jihyun Kim-Vick, *Branded recommerce: Analyzing early adopters to predict the future of fashion resale*

Secondhand fashion is a $28 billion industry, with revenues expected to double by 2024. Largely driven by the COVID-19 pandemic, consumers have begun to gravitate towards secondhand fashion more than previous years. Sparsely, several fashion companies have begun operating in-house resale programs, (branded recommerce) for two main purposes: generating revenue and promoting sustainability. Despite these massive valuations for the fashion resale industry, branded recommerce is a largely untapped market. This is unfamiliar territory for many fashion companies, so early adopters often enlist third-party technology companies for assistance. To better understand branded recommerce, seven separate SWOT analyses were conducted for early adopters (REI, Arc’teryx, GUCCI, Nike, Gap, Alexander Mcqueen & Balenciaga). Varying price-points were examined in order to draw overarching conclusions about each. Additionally, seven SWOT analyses were conducted on the complementary third-party tech platforms (Trove, Reflaut, Depop, The RealReal, ThredUp, Rebag & Vestaire Collective). My research consists of three primary goals: provide sufficient evidence to increase brand participation, further understand the hurdles that exist amongst early adopters and identify any existing gaps in knowledge. Research shows secondhand fashion revenue is only expected to grow, emphasizing the importance for companies to invest increasing time and resources.

**OS10: Exploring Accuracy and Truth**

Charles Fitzsimmons & Clarissa A. Thompson, *Developmental differences in monitoring accuracy and cue use when estimating whole-number and fraction magnitudes*

Magnitude understanding and metacognition are important in life and for academic achievement. In two studies, we examined children's and adults' metacognitive awareness of their whole-number and fraction magnitude estimates. There were few differences between grades or numerical ranges in third through fifth graders' (8-12-year-olds) and adults' (18-59-year-olds) item-by-item confidence and familiarity judgments, even when there were differences in estimation precision. A brief experience with unfamiliar fractions did not lead to greater familiarity or confidence, likely because of participants' extensive prior
experiences with numbers. Monitoring accuracy was poor across grades, suggesting it may be limited in number-line estimation. Additionally, participants relied on their familiarity to monitor their performance more during fraction than whole-number estimation, likely because people thought many large whole numbers were equally unfamiliar. Our data suggest people use different cues to monitor their fraction and whole-number magnitude estimation performance, yet monitoring accuracy is similar across number types.

Blair E. Braun, Maria S. Zaragoza, & Dustin Calvillo, *Social media and fake news: The role of repetition on the perceived accuracy of fake news*

With shares, retweets, and curated feeds based on algorithms, false claims can quickly spread across multiple social media platforms – exposing users to fake news multiple times and in different contexts. The goals of the present study were to investigate (1) the role of multiple repetitions (0, 1 or 3) on the perceived accuracy of fake news headlines in social media contexts (Facebook, Instagram, or Twitter), and (2) whether the perceived accuracy of repeated fake news headlines would be amplified by encountering them in different, as opposed to the same, social media context. We found clear evidence of an illusory truth effect but failed to find evidence that three repetitions increased perceived accuracy relative to a single exposure. In addition, participants rated false headlines as truer when they were repeated three times in the same social media contexts as compared to when they were encountered in three different social media contexts.

Daniel Burrill, *Endorsing misinformation to maintain cultural consistency*

As individuals evaluate news events, their sentiments about the actors involved in the events influence how they interpret the news. Negative views about an actor create expectations for negative behavior from that actor. When individuals hold negative sentiments about institutional actors, they are more likely to endorse claims that suggest negative behavior. Thus misinformation can be seen as an effort to align observations about the world with expectations about what the world is like. To test this argument, I identified an American political subculture characterized by populist ideology. Using an online survey, I measured the extent to which participants maintained populist beliefs, as well as their evaluations of two institutional actors; Journalists and Scientists, and one institutional outsider Whistle-blowers. Reading a series of vignettes, respondents reported how likely they thought each actor was to direct prosocial (educating) and antisocial (deceiving) behavior towards the public, regarding two serious social problems (COVID19 and Global Warming). Preliminary results suggest that more populist respondents are more likely to evaluate some institutional actors (journalists) negatively and that their endorsement of misinformation can be predicted by the amount of negative affect they experience when evaluating events that portray institutional actors negatively.

Jon Overton, *Building the pictures in our heads: The self-fulfilling prophecy of partisan conflict*
Animosity between American partisans has been rising for decades, producing governmental dysfunction, uncertainty, and even political violence. Theory and research on social identity processes imply that as antagonism rises, it may erode a shared sense of what it means to be American. I argue that to minimize the resulting psychological uncertainty, partisans will be drawn to outrage-driven media that castigates political opponents. Specifically, partisans will find vitriolic messages about members of the other political party reassuring, provoking the opposing party to respond with similar messages. That same search for psychological certainty will undermine support for political opponents' legal rights and encourage partisans to punish their own relatively moderate in-group members that are not sufficiently hostile to the opposition. To test these predictions, I conducted crowd-sourced survey experiments in fictitious social media environments that expose participants to high or low levels of partisan conflict. Results promise to shed light on the effects of escalating conflict on support for democratic norms.

**OS11: Public Health & Wellness**

Chelsey Kirkland, *Using HANS KAI to improve community health worker wellness and self-care*

Community health workers (CHWs) provide critical support services in their communities although they themselves are a low-income and historically marginalized population within the United States and thus would benefit from improved efforts to encourage wellness and self-care. This is especially important given additional need and demands for CHW services during and after the COVID-19 pandemic. Lack of published literature describing interventions focusing on this population, who have a substantially larger than average risk of chronic diseases and threats to physical, mental, and emotional health suggests the critical need for appropriate and effective programming. Using recommendations gathered from CHW and CHW supervisor focus groups, we collaborated with a Canadian group to adapt a peer-support program called HANS KAI for CHWs are currently piloting it with a convenience sample from an Ohio CHW training cohort. We used a quasi-experimental one-group design to explore 1) the effect of HANS KAI on CHW physical activity, 2) effect of HANS KAI on CHW burnout, and 3) the impact of HANS KAI on collective efficacy. Initial results demonstrate participants’ trend towards improved physical activity, burnout, and collective efficacy. Therefore, HANS KAI may be an effective program to improve CHW wellness and self-care.

Eniolufolake Ayoade & Mary Step, *Alcohol, Tobacco, and Marijuana use and HIV outcomes among young people living with HIV*

Although HIV disproportionately affects young people in the U.S., the impact of substance use on HIV outcomes has been scarcely studied among young people living with HIV (YPLH). This study explored the influence of alcohol, tobacco, and marijuana (ATM) on HIV outcomes in YPLH from ten locations in the U.S. We analyzed data from 955 YPLH (15-34 years) who participated in a national
demonstration project of social media-based interventions via audio computer-assisted self-interview survey. We assessed patterns of ATM use across HIV outcomes, using Chi-square to calculate proportions. Of daily alcohol users, 48% had a detectable viral load (VL), 16% reported antiretroviral therapy (ART) non-adherence, and 27% reported poor ability to use prescribed HIV medications. For daily tobacco users, 35% had a detectable VL and 21% showed poor ability to use prescribed HIV medications. Among daily marijuana users, 10% reported ART non-adherence while 19% exhibited poor ability to use prescribed HIV medications. Poorer outcomes were observed for daily ATM users compared to less frequent users. Daily ATM use increases the likelihood of poor HIV outcomes among YPLH. Effective substance use and medication adherence interventions may reduce this likelihood and decrease the HIV burden in young people.


As substance use continues to rise globally, the focus on developing and implementing evidence-based interventions has become paramount. However, there has been limited progress in decreasing the time it takes from the research to general use of evidence-based interventions by the public at large. This is the challenge of implementation science, and the need to establish comprehensive implementation theories, models and strategies. Research question: how can complexity theory be used to generate a grounded theory of innovation implementation, that when applied can reduce this research-to-practice gap? The purpose of this proposal is to develop a constructivist grounded theory of innovation implementation that addresses the complexity of the systemic barriers and facilitators impacting prevention intervention implementation. Aims: 1) To Identify the variables already explained in the literature that impact on innovation implementation, 2) To Identify the variables through data collection and analysis that will supplement those identified in existing literature. A qualitative methodology, constructivist grounded theory was selected to yield rich, in-depth descriptions and theoretical insights that address the purpose of this study. This will involve a literature review to identify existing factors identified and researched, and interviews to either concur with these or elicit new factors

MD Fourkan, *Does Medicaid Increase Emergency Room Use: Evidence from The Oregon Health Insurance Program?*

In this study, we identify the relationship between Medicaid expansion and emergency department use based on the data from Oregon Health Program. Among the relevant studies, Taubman et al. (2014) provide the positive relationship between the two objects with a rather limited approach that leads to the under-identification problem. To avoid the problem, we incorporate a copula regression analysis with an additional endogenous variable. As a result, we find that Medicaid expansion leads to a decrease in emergency department use, which is the opposite result of Taubman et al. (2014). This finding leads to a significant
impact on policy implementations regarding Medicaid and emergency room use for the United States of America.

Joy Mairura, GARMENT THERAPY: UNDERSTANDING THE THERAPEUTIC CONNECTIONS BETWEEN GARMENTS, ANXIETY AND DEPRESSION (Virtual)

Garment therapy bridges the gap between fashion and mental health. Over the years, mental illness has been on the rise. With depression and anxiety as the most highly experienced forms of mental illness in the United States, many forms of aid have come about to ease the experiences of those with mental illnesses. From medication to therapy and more holistic approaches, many have found relief through these avenues. As food, drink, and sleep are examples of Maslow’s hierarchy of needs (physiological), we also find clothing in this category. Over the years, many healing properties have been found in the foods we intake, what we drink, and how we sleep. However, minimal research has been done to inquire about the healing properties clothing may have. This research sought to ask the importance of clothing in one's daily life and study how one's wardrobe behaviors could positively impact their mental health.

OS12: COVID-19 Pandemic

Peter Oyewole & Oluwakemi Falana, Establishing a sense of community, creativity, and relationship among preschoolers and caregivers during and after the Covid-19 pandemic

The field of education is among the sectors with devastating effects of the Covid-19 pandemic. Before the pandemic, preschool centers have been a major place where children get socialized. Experts in child development suggest that social interactions at school teach children skills that are different but equally vital to academics. During the Covid-19 insurgence, changes were made in the classrooms to reduce children's activities. This may have been unfavorable for children's social and emotional development. This study, therefore, intends to review relationships among preschoolers and their caregivers and provide suggestions in enhancing and co-creating a sense of community as an approach to surpass the effects of the pandemic. According to UNESCO (2020), because of the pandemic, there is a need to reinforce community experience in schools, among caregivers and children, to address loneliness or helplessness, enable skill sharing, and discussion on coping strategies when preschool children face learning problems. When schools were closed during the Covid-19 outbreak, there were many concerns about what children would miss out on academically in terms of reading and writing, access to ICT equipment, and internet connections for learning. While these are valid issues, it's also necessary to consider the social and emotional consequences.

Mallory Wietrzykowski, Should COVID-19 vaccines be mandated? Applying Annette Baier's definitions of 'trust' and 'reliance' to evaluate the ethics of vaccine mandates

Trusting vaccines" seems to be the goal of most public health interventions, where increasing one's confidence in vaccines ought to increase a population's overall number of inoculations. However, I will argue that this use of the term 'trust'
misrepresents these "trust relations", leading to inadequate public health interventions. I will first present Annette Baier's definitions of 'trust' and 'reliance' to clarify why I believe vaccines cannot be trusted, but relied on. Second, I will apply these definitions to analyze the effectiveness of vaccine mandates. If vaccine mandates are to be a moral public health intervention, then I think that their outcomes should not only increase inoculations in a population, but also contribute towards a culture that has an enduring faith in vaccines. If mandates do not support a culture that is vaccine positive, then the results would only maintain or increase instances of vaccine hesitancy moving forward. By explaining how trust is a stronger determinant of one's decision to receive a vaccine; I will argue that since vaccine mandates seldom appeal to trust, they will be counterintuitive in efforts to increase inoculations. These results are harmful to the public's health and confidence in vaccines, so vaccine mandates are generally immoral.

Chloe Miller, *Unmasking political identity: Beliefs and behaviors during the coronavirus pandemic*

How does political identity affect mask-wearing and other preventive health behaviors during the novel coronavirus pandemic? I propose to answer this question using a symbolic interactionist approach. I will test a conceptual framework based on Stryker’s identity theory and related theory and research on political identity, using structural equation modeling (SEM) and a sample of 1,016 workers on Amazon Mechanical Turk (MTurk). My central hypothesis is that respondents who show a readiness to invoke the Republican identity in diverse situations (i.e., high Republican identity salience) will be less likely to perform preventive behaviors, while respondents who show a readiness to invoke the Democrat identity will be more likely to perform preventive behaviors. An evaluation of the theoretical model as a whole will reveal whether identity theory is able to account for politicized health-related behaviors. The results may help shape health policies for 21st century challenges related to pandemics and other local, national, and global scale emergencies.

Nicolle Simonovic & Jennifer Taber, *Examining the relationship between perceived ambiguity and predictors of health behavior across three contexts: The COVID-19 pandemic, antibiotic regimens, and e-cigarette use*

Ambiguity is a type of uncertainty from information that is unreliable, low in credibility, or is in some way inadequate. The experience of ambiguity can elicit avoidance behavior, which is theoretically expected to occur because of a more negative or pessimistic interpretation of risks and because of unfavorable perceptions of one's personal competence. Researchers have examined relationships between ambiguity and risk perceptions and between ambiguity and self-efficacy, a construct similar to competence. However, researchers have not empirically demonstrated that risk perceptions, self-efficacy, or competence account for avoidance behavior in response to perceived ambiguity. Further, research on the relationship between ambiguity and risk perceptions has demonstrated inconsistent effects. Examining the potential moderating role of
affect may clarify inconsistent effects between ambiguity and risk perceptions. Thus, the purpose of the present research is two-fold: (1) to test whether risk perceptions, self-efficacy, and competence mediate the relationship between ambiguity and behavioral avoidance, and (2) to examine whether fear and anger moderate the relationship between ambiguity and risk perceptions. To meet these aims, I examined data from a series of three online experimental studies across three distinct health contexts-- the COVID-19 pandemic, antibiotic regimens, and e-cigarette use.

Cheryl-lyn Ngoh, *Multichannel consumer segmentation: Do phases of store elimination pre- and during- COVID-19 influence consumer shopping behaviors?*

Segmentation carries important implications for retailers in developing effective multichannel strategies. COVID-19, combined with firms adjustments to their multichannel offerings, may have accelerated change in consumer shopping channel habits. This paper examines these issues through a customer segmentation study involving pre- and during-COVID-19 in-store and online channel shopping behavior. Latent Profile Analysis (LPA) using survey data from 485 U.S. participants identifies six multichannel consumer segments: 1) store-to-online, 2) store-focused, anti-online, 3) online-focused, anti-store, 4) multi-to-online, 5) store-focused, and 6) anti-online consumers. Within these segments, I find there are segments whose channel preferences have not changed as well as segments that shifted their channel preferences during COVID-19. As consumers' shopping behaviors change during COVID-19, the segmentation result suggests that these changes might affect their habits. I discuss the factors that characterize each segment and their channel switching intentions.